# Red Hat Enterprise Virtualization 3.2
# Installation Guide

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Installing Red Hat Enterprise Virtualization Environments
Edition 6

Andrew Burden Steve Gordon Tim Hildred

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## Edition 6

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**Abstract**

A comprehensive guide to installing Red Hat Enterprise Virtualization environments.

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# Preface

## 1. Document Conventions

This manual uses several conventions to highlight certain words and phrases and draw attention to specific pieces of information.

In PDF and paper editions, this manual uses typefaces drawn from the Liberation Fonts set. The Liberation Fonts set is also used in HTML editions if the set is installed on your system. If not, alternative but equivalent typefaces are displayed. Note: Red Hat Enterprise Linux 5 and later include the Liberation Fonts set by default.

### 1.1. Typographic Conventions

Four typographic conventions are used to call attention to specific words and phrases. These conventions, and the circumstances they apply to, are as follows.

**`Mono-spaced Bold`**

Used to highlight system input, including shell commands, file names and paths. Also used to highlight keys and key combinations. For example:

> To see the contents of the file **`my_next_bestselling_novel`** in your current working directory, enter the **`cat my_next_bestselling_novel`** command at the shell prompt and press **`Enter`** to execute the command.

The above includes a file name, a shell command and a key, all presented in mono-spaced bold and all distinguishable thanks to context.

Key combinations can be distinguished from an individual key by the plus sign that connects each part of a key combination. For example:

> Press **`Enter`** to execute the command.
>
> Press **`Ctrl`**+**`Alt`**+**`F2`** to switch to a virtual terminal.

The first example highlights a particular key to press. The second example highlights a key combination: a set of three keys pressed simultaneously.

If source code is discussed, class names, methods, functions, variable names and returned values mentioned within a paragraph will be presented as above, in **`mono-spaced bold`**. For example:

> File-related classes include **`filesystem`** for file systems, **`file`** for files, and **`dir`** for directories. Each class has its own associated set of permissions.

**Proportional Bold**

This denotes words or phrases encountered on a system, including application names; dialog box text; labeled buttons; check-box and radio button labels; menu titles and sub-menu titles. For example:

> Choose **System** → **Preferences** → **Mouse** from the main menu bar to launch **Mouse Preferences**. In the **`Buttons`** tab, select the **`Left-handed mouse`** check box and click **`Close`** to switch the primary mouse button from the left to the right (making the mouse suitable for use in the left hand).
>
> To insert a special character into a **gedit** file, choose **Applications** → **Accessories** →

**Character Map** from the main menu bar. Next, choose **Search** → **Find...** from the **Character Map** menu bar, type the name of the character in the **Search** field and click **Next**. The character you sought will be highlighted in the **Character Table**. Double-click this highlighted character to place it in the **Text to copy** field and then click the **Copy** button. Now switch back to your document and choose **Edit** → **Paste** from the **gedit** menu bar.

The above text includes application names; system-wide menu names and items; application-specific menu names; and buttons and text found within a GUI interface, all presented in proportional bold and all distinguishable by context.

***Mono-spaced Bold Italic*** or ***Proportional Bold Italic***

Whether mono-spaced bold or proportional bold, the addition of italics indicates replaceable or variable text. Italics denotes text you do not input literally or displayed text that changes depending on circumstance. For example:

To connect to a remote machine using ssh, type **ssh *username*@*domain.name*** at a shell prompt. If the remote machine is **example.com** and your username on that machine is john, type **ssh john@example.com**.

The **mount -o remount *file-system*** command remounts the named file system. For example, to remount the **/home** file system, the command is **mount -o remount /home**.

To see the version of a currently installed package, use the **rpm -q *package*** command. It will return a result as follows: ***package-version-release***.

Note the words in bold italics above — username, domain.name, file-system, package, version and release. Each word is a placeholder, either for text you enter when issuing a command or for text displayed by the system.

Aside from standard usage for presenting the title of a work, italics denotes the first use of a new and important term. For example:

Publican is a *DocBook* publishing system.

## 1.2. Pull-quote Conventions

Terminal output and source code listings are set off visually from the surrounding text.

Output sent to a terminal is set in **mono-spaced roman** and presented thus:

```
books        Desktop   documentation  drafts  mss    photos   stuff  svn
books_tests  Desktop1  downloads      images  notes  scripts  svgs
```

Source-code listings are also set in **mono-spaced roman** but add syntax highlighting as follows:

```
static int kvm_vm_ioctl_deassign_device(struct kvm *kvm,
                 struct kvm_assigned_pci_dev *assigned_dev)
{
         int r = 0;
         struct kvm_assigned_dev_kernel *match;

         mutex_lock(&kvm->lock);

         match = kvm_find_assigned_dev(&kvm->arch.assigned_dev_head,
                                       assigned_dev->assigned_dev_id);
         if (!match) {
                 printk(KERN_INFO "%s: device hasn't been assigned before, "
                   "so cannot be deassigned\n", __func__);
                 r = -EINVAL;
                 goto out;
         }

         kvm_deassign_device(kvm, match);

         kvm_free_assigned_device(kvm, match);

out:
         mutex_unlock(&kvm->lock);
         return r;
}
```

### 1.3. Notes and Warnings

Finally, we use three visual styles to draw attention to information that might otherwise be overlooked.

**Note**

Notes are tips, shortcuts or alternative approaches to the task at hand. Ignoring a note should have no negative consequences, but you might miss out on a trick that makes your life easier.

**Important**

Important boxes detail things that are easily missed: configuration changes that only apply to the current session, or services that need restarting before an update will apply. Ignoring a box labeled 'Important' will not cause data loss but may cause irritation and frustration.

**Warning**

Warnings should not be ignored. Ignoring warnings will most likely cause data loss.

## 2. Getting Help and Giving Feedback

### 2.1. Do You Need Help?

If you experience difficulty with a procedure described in this documentation, visit the Red Hat Customer

Portal at http://access.redhat.com. Through the customer portal, you can:

- search or browse through a knowledgebase of technical support articles about Red Hat products.
- submit a support case to Red Hat Global Support Services (GSS).
- access other product documentation.

Red Hat also hosts a large number of electronic mailing lists for discussion of Red Hat software and technology. You can find a list of publicly available mailing lists at https://www.redhat.com/mailman/listinfo. Click on the name of any mailing list to subscribe to that list or to access the list archives.

## 2.2. We Need Feedback!

If you find a typographical error in this manual, or if you have thought of a way to make this manual better, we would love to hear from you! Please submit a report in Bugzilla: http://bugzilla.redhat.com/ against the product **Red Hat Enterprise Virtualization Manager.**

When submitting a bug report, be sure to mention the manual's identifier: *Guides-Install*

If you have a suggestion for improving the documentation, try to be as specific as possible when describing it. If you have found an error, please include the section number and some of the surrounding text so we can find it easily.

# Part I. Before you Begin

# Chapter 1. Introduction

## 1.1. Red Hat Enterprise Virtualization Architecture

A Red Hat Enterprise Virtualization environment consists of:

- Virtual machine **hosts** using the Kernel-based Virtual Machine (KVM).
- **Agents and tools** running on hosts including VDSM, QEMU, and libvirt. These tools provide local management for virtual machines, networks and storage.
- The **Red Hat Enterprise Virtualization Manager**; a centralized management platform for the Red Hat Enterprise Virtualization environment. It provides a graphical interface where you can view, provision and manage resources.
- **Storage domains** to hold virtual resources like virtual machines, templates, ISOs.
- A **database** to track the state of and changes to the environment.
- Access to an external **Directory Server** to provide users and authentication.
- **Networking** to link the environment together. This includes physical network links, and logical networks.

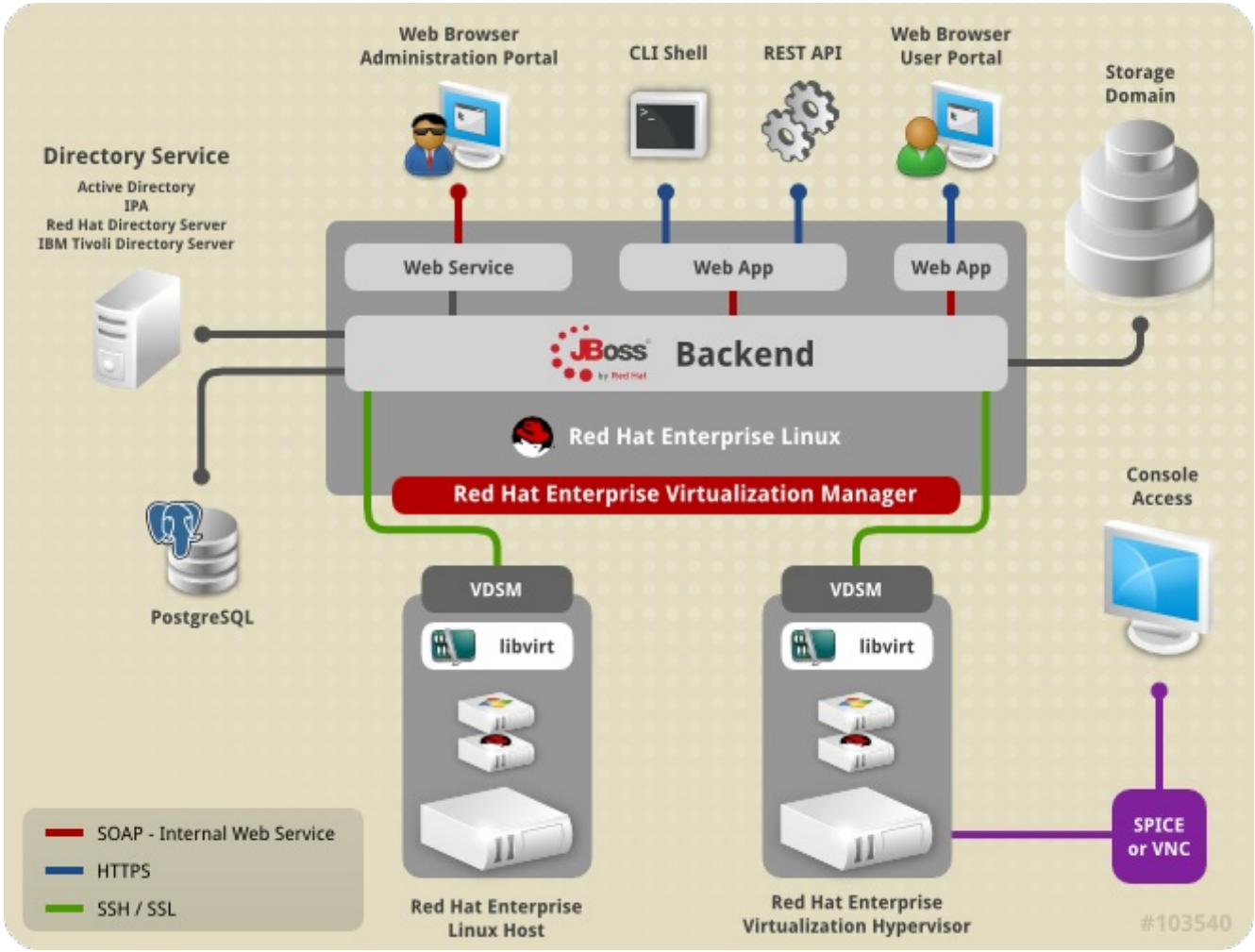


**Figure 1.1. Red Hat Enterprise Virtualization Platform Overview**

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## 1.2. Red Hat Enterprise Virtualization System Components

The Red Hat Enterprise Virtualization environment consists of one or more hosts (either Red Hat Enterprise Linux 6.3 or later hosts or Red Hat Enterprise Virtualization Hypervisor hosts) and at least one Red Hat Enterprise Virtualization Manager.

Hosts run virtual machines using KVM virtualization technology (Kernel-based Virtual Machine).

The Red Hat Enterprise Virtualization Manager runs on a Red Hat Enterprise Linux 6 server and provides interfaces for controlling the Red Hat Enterprise Virtualization environment. It manages virtual machine and storage provisioning, connection protocols, user sessions, virtual machine images, and high availability virtual machines.

The Red Hat Enterprise Virtualization Manager is accessed through the Administration Portal using a web browser.

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## 1.3. Red Hat Enterprise Virtualization Resources

The components of the Red Hat Enterprise Virtualization environment fall into two categories: physical resources, and logical resources. Physical resources are physical objects, such as host and storage servers. Logical resources are non-physical groupings and processes, such as logical networks and virtual machine templates.

- **Data Center** - A data center is the highest level container for all physical and logical resources within a managed virtual environment. It is a collection of clusters of virtual machines, storage, and networks.
- **Clusters** - A cluster is a set of physical hosts that are treated as a resource pool for virtual machines. Hosts in a cluster share the same network infrastructure and storage. They form a migration domain within which virtual machines can be moved from host to host.
- **Logical Networks** - A logical network is a logical representation of a physical network. Logical networks group network traffic and communication between the Manager, hosts, storage, and virtual machines.
- **Hosts** - A host is a physical server that runs one or more virtual machines. Hosts are grouped into clusters. Virtual machines can be migrated from one host to another within a cluster.
- **Storage Pool** - The storage pool is a logical entity that contains a standalone image repository of a certain type, either iSCSI, Fibre Channel, NFS, or POSIX. Each storage pool can contain several domains, for storing virtual machine disk images, ISO images, and for the import and export of virtual machine images.
- **Virtual Machines** - A virtual machine is a virtual desktop or virtual server containing an operating system and a set of applications. Multiple identical virtual machines can be created in a **Pool**. Virtual machines are created, managed, or deleted by power users and accessed by users.
- **Template** - A template is a model virtual machine with pre-defined settings. A virtual machine that is based on a particular template acquires the settings of the template. Using templates is the quickest way of creating a large number of virtual machines in a single step.
- **Virtual Machine Pool** - A virtual machine pool is a group of identical virtual machines that are available on demand by each group member. Virtual machine pools can be set up for different purposes. For example, one pool can be for the Marketing department, another for Research and Development, and so on.
- **Snapshot** - A snapshot is a view of a virtual machine's operating system and all its applications at a point in time. It can be used to save the settings of a virtual machine before an upgrade or installing

new applications. In case of problems, a snapshot can be used to restore the virtual machine to its original state.

- **User Types** - Red Hat Enterprise Virtualization supports multiple levels of administrators and users with distinct levels of permissions. System administrators can manage objects of the physical infrastructure, such as data centers, hosts, and storage. Users access virtual machines available from a virtual machine pool or standalone virtual machines made accessible by an administrator.
- **Events and Monitors** - Alerts, warnings, and other notices about activities help the administrator to monitor the performance and status of resources.
- **Reports** - A range of reports either from the reports module based on JasperReports, or from the data warehouse. Preconfigured or ad hoc reports can be generated from the reports module. Users can also generate reports using any query tool that supports SQL from a data warehouse that collects monitoring data for hosts, virtual machines, and storage.

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## 1.4. Red Hat Enterprise Virtualization API Support Statement

Red Hat Enterprise Virtualization exposes a number of interfaces for interacting with the components of the virtualization environment. These interfaces are in addition to the user interfaces provided by the Red Hat Enterprise Virtualization Manager Administration, User, and Reports Portals. Many of these interfaces are fully supported. Some however are supported only for read access or only when your use of them has been explicitly requested by Red Hat Support.

### Supported Interfaces for Read and Write Access

Direct interaction with these interfaces is supported and encouraged for both read and write access:

#### Representational State Transfer (REST) API

The REST API exposed by the Red Hat Enterprise Virtualization Manager is a fully supported interface for interacting with Red Hat Enterprise Virtualization Manager.

#### Software Development Kit (SDK)

The SDK provided by the *rhevm-sdk* package is a fully supported interface for interacting with Red Hat Enterprise Virtualization Manager.

#### Command Line Shell

The command line shell provided by the *rhevm-cli* package is a fully supported interface for interacting with the Red Hat Enterprise Virtualization Manager.

#### VDSM Hooks

The creation and use of VDSM hooks to trigger modification of virtual machines based on custom properties specified in the Administration Portal is supported on Red Hat Enterprise Linux virtualization hosts. The use of VDSM Hooks on virtualization hosts running Red Hat Enterprise Virtualization Hypervisor is not currently supported.

### Supported Interfaces for Read Access

Direct interaction with these interfaces is supported and encouraged only for read access. Use of these interfaces for write access is not supported unless explicitly requested by Red Hat Support:

#### Red Hat Enterprise Virtualization Manager History Database

Read access to the Red Hat Enterprise Virtualization Manager history database using the database views specified in the Administration Guide is supported. Write access is *not* supported.

#### Libvirt on Virtualization Hosts

Read access to **`libvirt`** using the **`virsh -r`** command is a supported method of interacting with virtualization hosts. Write access is *not* supported.

### Unsupported Interfaces

Direct interaction with these interfaces is *not* supported unless your use of them is explicitly requested by Red Hat Support:

#### The vdsClient Command

Use of the **`vdsClient`** command to interact with virtualization hosts is *not* supported unless explicitly requested by Red Hat Support.

#### Red Hat Enterprise Virtualization Hypervisor Console

Console access to Red Hat Enterprise Virtualization Hypervisor outside of the provided text user interface for configuration is *not* supported unless explicitly requested by Red Hat Support.

#### Red Hat Enterprise Virtualization Manager Database

Direct access to and manipulation of the Red Hat Enterprise Virtualization Manager database is *not* supported unless explicitly requested by Red Hat Support.

**Important**

Red Hat Support will not debug user created scripts or hooks except where it can be demonstrated that there is an issue with the interface being used rather than the user created script itself. For more general information about Red Hat support policies see https://access.redhat.com/support/offerings/production/soc.html.

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## 1.5. Introduction to Virtual Machines

A virtual machine is a software implementation of a computer. The Red Hat Enterprise Virtualization environment enables you to create virtual desktops and virtual servers.

Virtual machines consolidate computing tasks and workloads. In traditional computing environments, workloads usually run on individually administered and upgraded servers. Virtual machines reduce the amount of hardware and administration required to run the same computing tasks and workloads.

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## 1.6. Supported Virtual Machine Operating Systems

Red Hat Enterprise Virtualization presently supports the virtualization of these guest operating systems:

**Table 1.1. Supported virtual machine operating systems**

| Operating System | Architecture | SPICE support |
|---|---|---|
| Red Hat Enterprise Linux 3 | 32-bit, 64-bit | Yes |
| Red Hat Enterprise Linux 4 | 32-bit, 64-bit | Yes |
| Red Hat Enterprise Linux 5 | 32-bit, 64-bit | Yes |
| Red Hat Enterprise Linux 6 | 32-bit, 64-bit | Yes |
| Windows XP Service Pack 3 and newer | 32 bit | Yes |
| Windows 7 | 32-bit, 64-bit | Yes |
| Windows 8 | 32-bit, 64-bit | No |
| Windows Server 2003 Service Pack 2 and newer | 32-bit, 64-bit | Yes |
| Windows Server 2008 | 32 bit, 64 bit | Yes |
| Windows Server 2008 R2 | 64-bit | Yes |
| Windows Server 2012 R2 | 64-bit | No |

Remote Desktop Protocol (RDP) is the default connection protocol for accessing Windows 8 and Windows 2012 guests from the user portal as Microsoft introduced changes to the Windows Display Driver Model which prevent SPICE from performing optimally.

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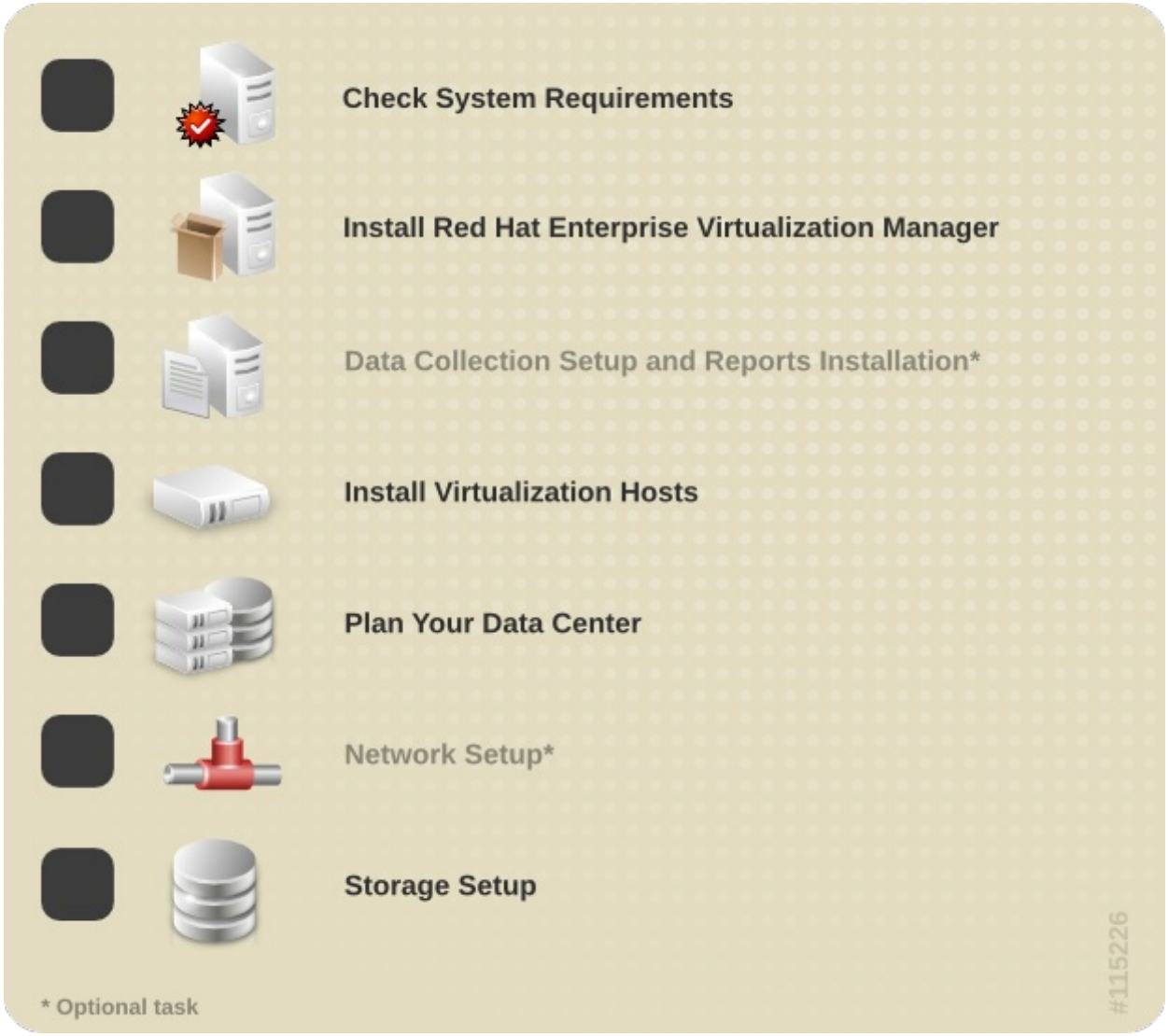
## 1.7. Red Hat Enterprise Virtualization Installation Workflow

Red Hat Enterprise Virtualization requires installation and configuration of several components to create a functioning virtualization environment. You must install and configure each component in the order shown in this checklist:




By completing these steps you will create a functioning Red Hat Enterprise Virtualization environment ready to host and run virtual machines.

- Chapter 2, *System Requirements*
- Part II, “Installing Red Hat Enterprise Virtualization Manager”
- Chapter 4, *Data Collection Setup and Reports Installation*
- Part III, “Installing Virtualization Hosts”
- Chapter 10, *Planning your Data Center*
- Chapter 11, *Network Setup*
- Chapter 12, *Storage Setup*

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# Chapter 2. System Requirements

## 2.1. Workflow Progress — System Requirements

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## 2.2. Hardware Requirements

### 2.2.1. Red Hat Enterprise Virtualization Hardware Requirements Overview

This section outlines the minimum hardware required to install, configure, and operate a Red Hat Enterprise Virtualization environment. To setup a Red Hat Enterprise Virtualization environment it is necessary to have, at least:

- one machine to act as the management server,
- one or more machines to act as virtualization hosts - at least two are required to support migration and power management,
- one or more machines to use as clients for accessing the Administration Portal.
- storage infrastructure provided by NFS, iSCSI, SAN, or local storage.

The hardware required for each of these systems is further outlined in the following sections. The Red

Hat Enterprise Virtualization environment also requires storage infrastructure that is accessible to the virtualization hosts. Storage infrastructure must be accessible using NFS, iSCSI, FC, or locally attached to virtualization hosts. The use of other POSIX compliant filesystems is also supported.

**See Also:**

- Section 2.2.2, “Red Hat Enterprise Virtualization Manager Hardware Requirements”
- Section 2.2.3, “Virtualization Host Hardware Requirements”

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## 2.2.2. Red Hat Enterprise Virtualization Manager Hardware Requirements

The minimum and recommended hardware requirements outlined here are based on a typical small to medium sized installation. The exact requirements vary between deployments based on sizing and load. Please use these recommendations as a guide only.

**Minimum**

- A dual core CPU.
- 4 GB of available system RAM that is not being consumed by existing processes.
- 25 GB of locally accessible, writeable, disk space.
- 1 Network Interface Card (NIC) with bandwidth of at least 1 Gbps.

**Recommended**

- A quad core CPU or multiple dual core CPUs.
- 16 GB of system RAM.
- 50 GB of locally accessible, writeable, disk space.
- 1 Network Interface Card (NIC) with bandwidth of at least 1 Gbps.

The Red Hat Enterprise Virtualization Manager runs on Red Hat Enterprise Linux. To confirm whether or not specific hardware items are certified for use with Red Hat Enterprise Linux refer to http://www.redhat.com/rhel/compatibility/hardware/.

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## 2.2.3. Virtualization Host Hardware Requirements

### 2.2.3.1. Virtualization Host Hardware Requirements Overview

Red Hat Enterprise Virtualization Hypervisors and Red Hat Enterprise Linux Hosts have a number of hardware requirements and supported limits.

- Section 2.2.3.2, “Virtualization Host CPU Requirements”
- Section 2.2.3.3, “Virtualization Host RAM Requirements”
- Section 2.2.3.4, “Virtualization Host Storage Requirements”
- Section 2.2.3.5, “Virtualization Host PCI Device Requirements”

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### 2.2.3.2. Virtualization Host CPU Requirements

Red Hat Enterprise Virtualization supports the use of these CPU models in virtualization hosts:

- AMD Opteron G1
- AMD Opteron G2
- AMD Opteron G3
- AMD Opteron G4
- AMD Opteron G5
- Intel Conroe
- Intel Penryn
- Intel Nehalem
- Intel Westmere
- Intel Sandybridge
- Intel Haswell

All CPUs must have support for the Intel® 64 or AMD64 CPU extensions, and the AMD-V™ or Intel VT® hardware virtualization extensions enabled. Support for the **No eXecute** flag (NX) is also required. To check that your processor supports the required flags, and that they are enabled:

- At the Red Hat Enterprise Linux or Red Hat Enterprise Virtualization Hypervisor boot screen press any key and select the **Boot** or **Boot with serial console** entry from the list. Press **Tab** to edit the kernel parameters for the selected option. After the last kernel parameter listed ensure there is a **Space** and append the **rescue** parameter.
- Press **Enter** to boot into rescue mode.
- At the prompt which appears, determine that your processor has the required extensions and that they are enabled by running this command:

  ```
  # grep -E 'svm|vmx' /proc/cpuinfo | grep nx
  ```

  If any output is shown, the processor is hardware virtualization capable. If no output is shown it is still possible that your processor supports hardware virtualization. In some circumstances manufacturers disable the virtualization extensions in the BIOS. Where you believe this to be the case consult the system's BIOS and the motherboard manual provided by the manufacturer.
- As an additional check, verify that the **kvm** modules are loaded in the kernel:

  ```
  # lsmod | grep kvm
  ```

  If the output includes **kvm_intel** or **kvm_amd** then the **kvm** hardware virtualization modules are loaded and your system meets requirements.

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#### 2.2.3.3. Virtualization Host RAM Requirements

It is recommended that virtualization hosts have at least 2 GB of RAM. The amount of RAM required varies depending on:

- guest operating system requirements,
- guest application requirements, and
- memory activity and usage of guests.

The fact that KVM is able to over-commit physical RAM for virtualized guests must also be taken into account. This allows provisioning of guests with RAM requirements greater than physically present on the basis where not all guests will be at peak load concurrently. KVM does this by only allocating RAM for guests as required and shifting underutilized guests into swap.

A maximum of 2 TB of RAM per virtualization host is currently supported.

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#### 2.2.3.4. Virtualization Host Storage Requirements

Virtualization hosts require local storage to store configuration, logs, kernel dumps, and for use as swap space. The minimum storage requirements of the Red Hat Enterprise Virtualization Hypervisor are documented in this section. The storage requirements for Red Hat Enterprise Linux hosts vary based on the amount of disk space used by their existing configuration but are expected to be greater than those of the Red Hat Enterprise Virtualization Hypervisor.

It is recommended that each virtualization host has at least 2 GB of internal storage. The minimum supported internal storage for each Hypervisor is the total of that required to provision the following partitions:

- The root partitions require at least 512 MB of storage.
- The configuration partition requires at least 8 MB of storage.
- The recommended minimum size of the logging partition is 2048 MB.
- The data partition requires at least 256 MB of storage. Use of a smaller data partition may prevent future upgrades of the Hypervisor from the Red Hat Enterprise Virtualization Manager. By default all disk space remaining after allocation of swap space will be allocated to the data partition.
- The swap partition requires at least 8 MB of storage. The recommended size of the swap partition varies depending on both the system the Hypervisor is being installed upon and the anticipated level of overcommit for the environment. Overcommit allows the Red Hat Enterprise Virtualization environment to present more RAM to guests than is actually physically present. The default overcommit ratio is **`0.5`**.

  The recommended size of the swap partition can be determined by:
  - Multiplying the amount of system RAM by the expected overcommit ratio, and adding
  - 2 GB of swap space for systems with 4 GB of RAM or less, or
  - 4 GB of swap space for systems with between 4 GB and 16 GB of RAM, or
  - 8 GB of swap space for systems with between 16 GB and 64 GB of RAM, or
  - 16 GB of swap space for systems with between 64 GB and 256 GB of RAM.

  **Example 2.1. Calculating Swap Partition Size**

  For a system with 8 GB of RAM this means the formula for determining the amount of swap space to allocate is:

  ```
  (8 GB x 0.5) + 4 GB = 8 GB
  ```

**Important**

By default the Red Hat Enterprise Virtualization Hypervisor defines a swap partition sized using the recommended formula. An overcommit ratio of **0.5** is used for this calculation. For some systems the result of this calculation may be a swap partition that requires more free disk space than is available at installation. Where this is the case Hypervisor installation will fail.
If you encounter this issue, manually set the sizes for the Hypervisor disk partitions using the ***storage_vol*** boot parameter. More information on the use of this parameter is available in the Red Hat Enterprise Linux 6 *Hypervisor Deployment Guide*.

**Example 2.2. Manually Setting Swap Partition Size**
In this example the ***storage_vol*** boot parameter is used to set a swap partition size of 4096 MB. Note that no sizes are specified for the other partitions, allowing the Hypervisor to use the default sizes.

```
storage_vol=:4096::::
```

**Important**

The Red Hat Enterprise Virtualization Hypervisor does not support installation on **fakeraid** devices. Where a **fakeraid** device is present it must be reconfigured such that it no longer runs in RAID mode.

1. Access the RAID controller's BIOS and remove all logical drives from it.
2. Change controller mode to be non-RAID. This may be referred to as compatibility or JBOD mode.

Access the manufacturer provided documentation for further information related to the specific device in use.

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#### 2.2.3.5. Virtualization Host PCI Device Requirements

Virtualization hosts must have at least one network interface with a minimum bandwidth of 1 Gbps. It is recommended that each virtualization host have two network interfaces with a minimum bandwidth of 1 Gbps to support network intensive activity, including virtual machine migration.

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## 2.3. Software Requirements

### 2.3.1. Red Hat Enterprise Virtualization Operating System Requirements

- Red Hat Enterprise Virtualization Manager requires Red Hat Enterprise Linux 6.3 Server or later. Complete successful installation of the operating system prior to commencing installation of the Red Hat Enterprise Virtualization Manager.
- Virtualization hosts must run version 6.3, or later, of either:

- Red Hat Enterprise Virtualization Hypervisor, or
- Red Hat Enterprise Linux Server.

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### 2.3.2. Red Hat Enterprise Virtualization Manager Client Requirements

Use a client with a supported web browser to access the Administration Portal, and the User Portal. The portals support the following clients and browsers:

- Mozilla Firefox 17, and later, on Red Hat Enterprise Linux is required to access both portals.
- Internet Explorer 8, and later, on Microsoft Windows is required to access the User Portal. Use the desktop version, not the touch-screen version of Internet Explorer 10.
- Internet Explorer 9, and later, on Microsoft Windows is required to access the Administration Portal. Use the desktop version, not the touch-screen version of Internet Explorer 10.

Install a supported SPICE client to access virtual machine consoles. Supported SPICE clients are available on the following operating systems:

- Red Hat Enterprise Linux 5.8+ (i386, AMD64 and Intel 64)*

**Note**

The Red Hat Enterprise Linux 5 SPICE client (**spicec**) does not support all of the features present in the latest SPICE client. WAN optimizations, dynamic console resizing, proxying, and mime types are not supported.

- Red Hat Enterprise Linux 6.2+ (i386, AMD64 and Intel 64)*

**Note**

The versions of SPICE clients (**virt-viewer**) prior to the one shipped with Red Hat Enterprise Linux 6.5 do not support all of the features present in the latest SPICE client. Proxying is not supported.

- Windows XP
- Windows XP Embedded (XPe)
- Windows 7 (x86, AMD64 and Intel 64)
- Windows 8 (x86, AMD64 and Intel 64)
- Windows Embedded Standard 7
- Windows 2008/R2 (x86, AMD64 and Intel 64)
- Windows Embedded Standard 2009
- Red Hat Enterprise Virtualization Certified Linux-based thin clients

When you access the portal(s) using Mozilla Firefox the SPICE client is provided by the *spice-xpi* package, which you must manually install using **yum**.

When you access the portal(s) using Internet Explorer the SPICE ActiveX control will automatically be downloaded and installed.

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### 2.3.3. Red Hat Enterprise Virtualization Manager Software Channels

Installation of the Red Hat Enterprise Virtualization Manager requires that the system be subscribed to a number of Red Hat Network channels in addition to those required for Red Hat Enterprise Linux. These channels are used to retrieve both the initial installation packages and later updates as they become available.

**Note**

Refer to the *Red Hat Enterprise Virtualization Manager Release Notes* for specific channel names current to your system.

You must ensure that you have entitlements to the required channels listed here before proceeding with installation.

**Certificate-based Red Hat Network**

- The **Red Hat Enterprise Linux Server** entitlement, provides Red Hat Enterprise Linux.
- The **Red Hat Enterprise Virtualization** entitlement, provides Red Hat Enterprise Virtualization Manager.
- The **JBoss Enterprise Application Platform** entitlement, provides the supported release of the application platform on which the Manager runs.

**Red Hat Network Classic**

- The **Red Hat Enterprise Linux Server (v. 6 for 64-bit x86_64)** channel, also referred to as **rhel-x86_64-server-6**, provides Red Hat Enterprise Linu 6 Server. The Channel Entitlement name for this channel is **Red Hat Enterprise Linux Server (v. 6)**.
- The **RHEL Server Supplementary (v. 6 64-bit x86_64)** channel, also referred to as **rhel-x86_64-server-supplementary-6**, provides the *virtio-win* package. The *virtio-win* package provides the Windows VirtIO drivers for use in virtual machines. The Channel Entitlement Name for the supplementary channel is **Red Hat Enterprise Linux Server Supplementary (v. 6)**.
- The **Red Hat Enterprise Virtualization Manager (*version.number* x86_64)** channel, also referred to as **rhel-x86_64-server-6-rhevm-*version.number***, provides Red Hat Enterprise Virtualization Manager. The Channel Entitlement Name for this channel is **Red Hat Enterprise Virtualization Manager (v3)**.
- The **Red Hat JBoss EAP (v 6) for 6Server x86_64** channel, also referred to as **jbappplatform-6-x86_64-server-6-rpm**, provides the supported release of the application platform on which the Manager runs. The Channel Entitlement Name for this channel is **JBoss Enterprise Application Platform (v 4, zip format)**.

**See Also:**

- Section 3.3, “Subscribing to the Red Hat Enterprise Virtualization Channels”

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### 2.3.4. Directory Services

#### 2.3.4.1. About Directory Services

The term directory service refers to the collection of software, hardware, and processes that store information about an enterprise, subscribers, or both, and make that information available to users. A directory service consists of at least one directory server and at least one directory client program. Client programs can access names, phone numbers, addresses, and other data stored in the directory service.

**See Also:**

- Section 2.3.4.2, “Directory Services Support in Red Hat Enterprise Virtualization”

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### 2.3.4.2. Directory Services Support in Red Hat Enterprise Virtualization

During installation Red Hat Enterprise Virtualization Manager creates its own internal administration user, **admin**. This account is intended for use when initially configuring the environment, and for troubleshooting. To add other users to Red Hat Enterprise Virtualization you will need to attach a directory server to the Manager using the Domain Management Tool, **rhevm-manage-domains**.

Once at least one directory server has been attached to the Manager you will be able to add users that exist in the directory server and assign roles to them using the Administration Portal. Users will be identified by their User Principle Name (UPN) of the form ***user@domain***. Attachment of more than one directory server to the Manager is also supported.

The directory servers currently supported for use with Red Hat Enterprise Virtualization 3.2 are:

- Active Directory;
- Identity Management (IdM); and
- Red Hat Directory Server 9 (RHDS 9).

You must ensure that the correct DNS records exist for your directory server. In particular you must ensure that the DNS records for the directory server include:

- A valid pointer record (PTR) for the directory server's reverse look-up address.
- A valid service record (SRV) for LDAP over TCP port **389**.
- A valid service record (SRV) for Kerberos over TCP port **88**.
- A valid service record (SRV) for Kerberos over UDP port **88**.

If these records do not exist in DNS then you will be unable to add the domain to the Red Hat Enterprise Virtualization Manager configuration using **rhevm-manage-domains**.

For more detailed information on installing and configuring a supported directory server, refer to the vendor's documentation:

- Active Directory - http://technet.microsoft.com/en-us/windowsserver/dd448614.
- Identity Management (IdM) - http://docs.redhat.com/docs/en-US/Red_Hat_Enterprise_Linux/6/html/Identity_Management_Guide/index.html
- Red Hat Directory Server (RHDS) - http://docs.redhat.com/docs/en-US/Red_Hat_Directory_Server/index.html

**Important**

A user must be created in the directory server specifically for use as the Red Hat Enterprise Virtualization administrative user. Do *not* use the administrative user for the directory server as the Red Hat Enterprise Virtualization administrative user.

**Important**

It is not possible to install Red Hat Enterprise Virtualization Manager (*rhevm*) and IdM (*ipa-server*) on the same system. IdM is incompatible with the *mod_ssl* package, which is required by Red Hat Enterprise Virtualization Manager.

**Important**

If you are using Active Directory as your directory server, and you wish to use **sysprep** in the creation of Templates and Virtual Machines, then the Red Hat Enterprise Virtualization administrative user must be delegated control over the Domain to:

- **Join a computer to the domain**
- **Modify the membership of a group**

For information on creation of user accounts in Active Directory refer to http://technet.microsoft.com/en-us/library/cc732336.aspx.
For information on delegation of control in Active Directory refer to http://technet.microsoft.com/en-us/library/cc732524.aspx.

**Note**

Red Hat Enterprise Virtualization Manager uses Kerberos to authenticate with directory servers. RHDS does not provide native support for Kerberos. If you are using RHDS as your directory server then you must ensure that the directory server is made a service within a valid Kerberos domain. To do this you will need to perform these steps while referring to the relevant directory server documentation:

- Configure the **memberOf** plug-in for RHDS to allow group membership. In particular ensure that the value of the ***memberofgroupattr*** attribute of the **memberOf** plug-in is set to **uniqueMember**.
  Consult the Red Hat Directory Server 9.0 *Plug-in Guide* for more information on configuring the **memberOf** plug-in.
- Define the directory server as a service of the form **ldap/*hostname*@*REALMNAME*** in the Kerberos realm. Replace ***hostname*** with the fully qualified domain name associated with the directory server and ***REALMNAME*** with the fully qualified Kerberos realm name. The Kerberos realm name must be specified in capital letters.
- Generate a **keytab** file for the directory server in the Kerberos realm. The **keytab** file contains pairs of Kerberos principals and their associated encrypted keys. These keys will allow the directory server to authenticate itself with the Kerberos realm.
  Consult the documentation for your Kerberos principle for more information on generating a **keytab** file.
- Install the **keytab** file on the directory server. Then configure RHDS to recognize the **keytab** file and accept Kerberos authentication using GSSAPI.
  Consult the Red Hat Directory Server 9.0 *Administration Guide* for more information on configuring RHDS to use an external **keytab** file.
- Test the configuration on the directory server by using the **kinit** command to authenticate as a user defined in the Kerberos realm. Once authenticated run the **ldapsearch** command against the directory server. Use the ***-Y GSSAPI*** parameters to ensure the use of Kerberos for authentication.

**See Also:**

- Section B.1, “Domain Management Tool”
- Section 2.3.5.3, “Directory Server Firewall Requirements”

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## 2.3.5. Firewall Configuration

### 2.3.5.1. Red Hat Enterprise Virtualization Manager Firewall Requirements

The Red Hat Enterprise Virtualization Manager requires that a number of ports be opened to allow network traffic through the system's firewall. The **rhevm-setup** script is able to configure the firewall automatically, but this will overwrite any pre-existing firewall configuration.

Where an existing firewall configuration exists the firewall rules required by the Manager must instead be manually inserted into it. The **rhevm-setup** command will save a list of the **iptables** rules required in the **/usr/share/ovirt-engine/conf/iptables.example** file.

The firewall configuration documented here assumes a default configuration. Where non-default HTTP

and HTTPS ports are chosen during installation adjust the firewall rules to allow network traffic on the ports that were selected - not the default ports (**80** and **443**) listed here.

**Table 2.1. Red Hat Enterprise Virtualization Manager Firewall Requirements**

| Port(s) | Protocol | Source | Destination | Purpose |
|---|---|---|---|---|
| - | ICMP | • Red Hat Enterprise Virtualization Hypervisor(s)<br>• Red Hat Enterprise Linux host(s) | • Red Hat Enterprise Virtualization Manager | When registering to the Red Hat Enterprise Virtualization Manager, virtualization hosts send an ICMP ping request to the Manager to confirm that it is online. |
| 22 | TCP | • System(s) used for maintenance of the Manager including backend configuration, and software upgrades. | • Red Hat Enterprise Virtualization Manager | SSH (optional) |
| 80, 443 | TCP | • Administration Portal clients<br>• User Portal clients<br>• Red Hat Enterprise Virtualization Hypervisor(s)<br>• Red Hat Enterprise Linux host(s)<br>• REST API clients | • Red Hat Enterprise Virtualization Manager | Provides HTTP and HTTPS access to the Manager. |

**Important**

In environments where the Red Hat Enterprise Virtualization Manager is also required to export NFS storage, such as an ISO Storage Domain, additional ports must be allowed through the firewall. Grant firewall exceptions for the ports applicable to the version of NFS in use:
**NFSv4**

- TCP port **2049** for NFS.

**NFSv3**

- TCP and UDP port **2049** for NFS.
- TCP and UDP port **111** (**rpcbind**/**sunrpc**).
- TCP and UDP port specified with **MOUNTD_PORT="*port*"**
- TCP and UDP port specified with **STATD_PORT="*port*"**
- TCP port specified with **LOCKD_TCPPORT="*port*"**
- UDP port specified with **LOCKD_UDPPORT="*port*"**

The **MOUNTD_PORT**, **STATD_PORT**, **LOCKD_TCPPORT**, and **LOCKD_UDPPORT** ports are configured in the **/etc/sysconfig/nfs** file.

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#### 2.3.5.2. Virtualization Host Firewall Requirements

Both Red Hat Enterprise Linux hosts and Red Hat Enterprise Virtualization Hypervisors require that a number of ports be opened to allow network traffic through the system's firewall. In the case of the Red Hat Enterprise Virtualization Hypervisor these firewall rules are configured automatically. For Red Hat Enterprise Linux hosts however it is necessary to manually configure the firewall.

**Table 2.2. Virtualization Host Firewall Requirements**

| Port(s) | Protocol | Source | Destination | Purpose |
|---|---|---|---|---|
| 22 | TCP | • Red Hat Enterprise Virtualization Manager | • Red Hat Enterprise Virtualization Hypervisor(s)<br>• Red Hat Enterprise Linux host(s) | Secure Shell (SSH) access. |
| 5900 - 6411 | TCP | • Administration Portal clients<br>• User Portal clients | • Red Hat Enterprise Virtualization Hypervisor(s)<br>• Red Hat Enterprise Linux host(s) | Remote guest console access via VNC and SPICE. These ports must be open to facilitate client access to virtual machines. |
| 5989 | TCP, UDP | • Common Information Model Object Manager (CIMOM) | • Red Hat Enterprise Virtualization Hypervisor(s)<br>• Red Hat Enterprise Linux host(s) | Used by Common Information Model Object Managers (CIMOM) to monitor virtual machines running on the virtualization host. If you wish to use a CIMOM to monitor the virtual machines in your virtualization environment then you must ensure that this port is open. |
| 16514 | TCP | • Red Hat Enterprise Virtualization Hypervisor(s)<br>• Red Hat Enterprise Linux host(s) | • Red Hat Enterprise Virtualization Hypervisor(s)<br>• Red Hat Enterprise Linux host(s) | Virtual machine migration using **`libvirt`**. |
| 49152 - 49216 | TCP | • Red Hat Enterprise Linux Hypervisor(s)<br>• Red Hat | • Red Hat Enterprise Linux Hypervisor(s)<br>• Red Hat | Virtual machine migration and fencing using VDSM. These ports must be open facilitate |

| | | | | |
|---|---|---|---|---|
| | | Enterprise Linux host(s) | Enterprise Linux host(s) | both automated and manually initiated migration of virtual machines. |
| 54321 | TCP | • Red Hat Enterprise Virtualization Manager<br>• Red Hat Enterprise Virtualization Hypervisor(s)<br>• Red Hat Enterprise Linux host(s) | • Red Hat Enterprise Virtualization Hypervisor(s)<br>• Red Hat Enterprise Linux host(s) | VDSM communications with the Manager and other virtualization hosts. |

**Example 2.3. Option Name: IPTablesConfig**

Recommended (default) values: Automatically generated by vdsm bootstrap script

```
*filter
:INPUT ACCEPT [0:0]
:FORWARD ACCEPT [0:0]
:OUTPUT ACCEPT [0:0]
-A INPUT -m state --state ESTABLISHED,RELATED -j ACCEPT
-A INPUT -p icmp -j ACCEPT
-A INPUT -i lo -j ACCEPT
# vdsm
-A INPUT -p tcp --dport 54321 -j ACCEPT
# libvirt tls
-A INPUT -p tcp --dport 16514 -j ACCEPT
# SSH
-A INPUT -p tcp --dport 22 -j ACCEPT
# guest consoles
-A INPUT -p tcp -m multiport --dports 5634:6166 -j ACCEPT
# migration
-A INPUT -p tcp -m multiport --dports 49152:49216 -j ACCEPT
# snmp
-A INPUT -p udp --dport 161 -j ACCEPT
# Reject any other input traffic
-A INPUT -j REJECT --reject-with icmp-host-prohibited
-A FORWARD -m physdev ! --physdev-is-bridged -j REJECT --reject-with icmp-host-
prohibited
COMMIT
```

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### 2.3.5.3. Directory Server Firewall Requirements

Red Hat Enterprise Virtualization requires a directory server to support user authentication. A number of ports must be opened in the directory server's firewall to support GSS-API authentication as used by the Red Hat Enterprise Virtualization Manager.

**Table 2.3. Host Firewall Requirements**

| Port(s) | Protocol | Source | Destination | Purpose |
|---|---|---|---|---|
| 88, 464 | TCP, UDP | Red Hat Enterprise Virtualization Manager | Directory server | Kerberos authentication. |
| 389, 636 | TCP | Red Hat Enterprise Virtualization Manager | Directory server | Lightweight Directory Access Protocol (LDAP) and LDAP over SSL. |

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#### 2.3.5.4. Database Server Firewall Requirements

Red Hat Enterprise Virtualization supports the use of a remote database server. If you plan to use a remote database server with Red Hat Enterprise Virtualization then you must ensure that the remote database server allows connections from the Manager.

**Table 2.4. Host Firewall Requirements**

| Port(s) | Protocol | Source | Destination | Purpose |
|---|---|---|---|---|
| 5432 | TCP, UDP | Red Hat Enterprise Virtualization Manager | PostgreSQL database server | Default port for PostgreSQL database connections. |

If you plan to use a local database server on the Manager itself, which is the default option provided during installation, then no additional firewall rules are required.

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### 2.3.6. Required User Accounts and Groups

#### 2.3.6.1. Red Hat Enterprise Virtualization Manager User Accounts

When the *rhevm* package is installed a number of user accounts are created to support Red Hat Enterprise Virtualization. The user accounts created as a result of *rhevm* package installation are as follows. The default user identifier (UID) for each account is also provided:

- The **`vdsm`** user (UID **`36`**). Required for support tools that mount and access NFS storage domains.
- The **`ovirt`** user (UID **`108`**). Owner of the **`ovirt-engine`** JBoss Enterprise Application Platform instance.

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#### 2.3.6.2. Red Hat Enterprise Virtualization Manager Groups

When the *rhevm* package is installed a number of user groups are created. The user groups created as a result of *rhevm* package installation are as follows. The default group identifier (GID) for each group is also listed:

- The **kvm** group (GID **36**). Group members include:
  - The **vdsm** user.
- The **ovirt** group (GID **108**). Group members include:
  - The **ovirt** user.

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#### 2.3.6.3. Virtualization Host User Accounts

When the *vdsm* and *qemu-kvm-rhev* packages are installed a number of user accounts are created. These are the user accounts that are created on the virtualization host as a result of *vdsm* and *qemu-kvm-rhev* package installation. The default user identifier (UID) for each entry is also listed:

- The **vdsm** user (UID **36**).
- The **qemu** user (UID **107**).
- The **sanlock** user (UID **179**).

In addition Red Hat Enterprise Virtualization Hypervisor hosts define a **admin** user (UID **500**). This **admin** user is not created on Red Hat Enterprise Linux virtualization hosts. The **admin** user is created with the required permissions to run commands as the **root** user using the **sudo** command. The **vdsm** user which is present on both types of virtualization hosts is also given access to the **sudo** command.

**Important**

The user identifiers (UIDs) and group identifiers (GIDs) allocated may vary between systems. The **vdsm** user however is fixed to a UID of **36** and the **kvm** group is fixed to a GID of **36**. If UID **36** or GID **36** is already used by another account on the system then a conflict will arise during installation of the *vdsm* and *qemu-kvm-rhev* packages.

Report a bug

#### 2.3.6.4. Virtualization Host Groups

When the *vdsm* and *qemu-kvm-rhev* packages are installed a number of user groups are created. These are the groups that are created on the virtualization host as a result of *vdsm* and *qemu-kvm-rhev* package installation. The default group identifier (GID) for each entry is also listed:

- The **kvm** group (GID **36**). Group members include:
  - The **qemu** user.
  - The **sanlock** user.
- The **qemu** group (GID **107**). Group members include:
  - The **vdsm** user.
  - The **sanlock** user.

**Important**

The user identifiers (UIDs) and group identifiers (GIDs) allocated may vary between systems. The **vdsm** user however is fixed to a UID of **36** and the **kvm** group is fixed to a GID of **36**. If UID **36** or GID **36** is already used by another account on the system then a conflict will arise during installation of the *vdsm* and *qemu-kvm-rhev* packages.

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# Part II. Installing Red Hat Enterprise Virtualization Manager

# Chapter 3. Manager Installation

## 3.1. Workflow Progress — Installing Red Hat Enterprise Virtualization Manager

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## 3.2. Manager Installation Overview

**Prerequisites:**

- Section 2.2, “Hardware Requirements”
- Section 2.3, “Software Requirements”

Before proceeding with Red Hat Virtualization Manager installation you must ensure that all prerequisites are met. Only once you have confirmed that all prerequisites are met are you ready to proceed with installation.

To complete installation of the Red Hat Enterprise Virtualization Manager successfully you must also be able to determine:

1. The ports to be used for HTTP, and HTTPS, communication. The defaults are **80** and **443**

respectively.

2. The Fully Qualified Domain Name (FQDN) of the system the Manager is to be installed on.
3. The password you will use to secure the Red Hat Enterprise Virtualization administration account.
4. The location of the database server to be used. You can use the setup script to install and configure a local database server or use an existing remote database server. To use a remote database server you will need to know:
   - the hostname of the system on which the remote database server exists,
   - the port on which the remote database server is listening.
   - that the **uuid-ossp** extension had been loaded by the remote database server.

   Additionally you must know the username and password of a user that is known to the remote database server. The user must have permission to create databases in PostgreSQL.
5. The Organization Name to use when creating the Manager's security certificates.
6. The storage type to be used for the initial data center attached to the Manager. The default is NFS.
7. The path to use for the ISO share, if the Manager is being configured to provide one. The display name, which will be used to label the domain in the Red Hat Enterprise Virtualization Manager also needs to be provided.
8. The firewall rules, if any, present on the system that need to be integrated with the rules required for the Manager to function.

Before installation is completed the values selected are displayed for confirmation. Once the values have been confirmed they are applied and the Red Hat Enterprise Virtualization Manager is ready for use.

**Example 3.1. Completed Installation**

```
RHEV Manager will be installed using the following configuration:
==================================================================
override-httpd-config:         yes
http-port:                     80
https-port:                    443
host-fqdn:                     rhevm31.demo.redhat.com
auth-pass:                     ********
org-name:                      demo.redhat.com
default-dc-type:               NFS
db-remote-install:             local
db-local-pass:                 ********
nfs-mp:                        /usr/local/exports/iso
config-nfs:                    yes
override-iptables:             yes
Proceed with the configuration listed above? (yes|no): yes
```

**Note**

Automated installations are created by providing **rhevm-setup** with an answer file. An answer file contains answers to the questions asked by the setup command.

- To create an answer file, use the ***--gen-answer-file*** parameter to set the location to which the answer file must be saved. The **rhevm-setup** command will record your answers to the file.

```
# rhevm-setup --gen-answer-file=ANSWER_FILE
```

- To use an answer file for a new installation, use the ***--answer-file*** parameter to set the location of the answer file that must be used. The command **rhevm-setup** command will use the answers stored in the file to complete installation.

```
# rhevm-setup --answer-file=ANSWER_FILE
```

Run **rhevm-setup *--help*** for further information.

**Note**

Offline installation requires the creation of a software repository local to your Red Hat Enterprise Virtualization environment. This software repository must contain all of the packages required to install Red Hat Enterprise Virtualization Manager, Red Hat Enterprise Linux virtualization hosts, and Red Hat Enterprise Linux virtual machines.
If you wish to create such a repository, refer to the *Installing Red Hat Enterprise Virtualization Offline* technical brief, available at https://access.redhat.com/knowledge/techbriefs/installing-red-hat-enterprise-virtualization-offline-rhev-30.

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## 3.3. Subscribing to the Red Hat Enterprise Virtualization Channels

### 3.3.1. Subscribing to the Red Hat Enterprise Virtualization Manager Channels using Subscription Manager

#### Summary

To install Red Hat Enterprise Virtualization Manager you must first register the target system to Red Hat Network and subscribe to the required software channels.

**Procedure 3.1. Subscribing to the Red Hat Enterprise Virtualization Manager Channels using Subscription Manager**

1. Run the **subscription-manager *register*** command to register the system with Red Hat Network. To complete registration successfully you will need to supply your Red Hat Network **Username** and **Password** when prompted.

```
# subscription-manager register
```

2. **Identify Available Entitlement Pools**

   To subscribe the system to Red Hat Enterprise Virtualization you must locate the identifiers for the relevant entitlement pools. Use the ***list*** action of the **subscription-manager** to find these.

   To identify available subscription pools for **Red Hat Enterprise Linux Server** use the command:

   ```
   # subscription-manager list --available | grep -A8 "Red Hat Enterprise Linux
   Server"
   ```

   To identify available subscription pools for **Red Hat Enterprise Virtualization** use the command:

   ```
   # subscription-manager list --available | grep -A8 "Red Hat Enterprise
   Virtualization"
   ```

   To identify available subscription pools for **JBoss Enterprise Application Platform** use the command:

   ```
   # subscription-manager list --available | grep -A8 "JBoss Enterprise
   Application Platform"
   ```

3. **Subscribe System to Entitlement Pools**

   Using the pool identifiers located in the previous step, subscribe the system to **Red Hat Enterprise Linux Server**, **Red Hat Enterprise Virtualization**, and **JBoss Application Platform** entitlements. Use the ***subscribe*** parameter to the **subscription-manager** command, replacing ***POOLID*** with one of the pool identifiers each time the command is run.:

   ```
   # subscription-manager subscribe --pool=POOLID
   ```

4. **Enable Red Hat Enterprise Virtualization Manager 3.2 Repository**

   Subscribing to a **Red Hat Enterprise Virtualization** entitlement pool also subscribes the system to the Red Hat Enterprise Virtualization Manager 3.2 software repository. By default this software repository is available, but disabled. The Red Hat Enterprise Virtualization Manager 3.2 software repository must be enabled using the **yum-config-manager** command as the **root** user:

   ```
   # yum-config-manager --enable rhel-6-server-rhevm-3.2-rpms
   ```

5. **Enable Supplementary Repository**

   Subscribing to a **Red Hat Enterprise Linux Server** entitlement pool also subscribes the system to the supplementary software repository. By default this software repository is available, but disabled. The supplementary software repository must be enabled using the **yum-config-manager** command as the **root** user:

   ```
   # yum-config-manager --enable rhel-6-server-supplementary-rpms
   ```

6. **Enable JBoss Enterprise Application Platform Repository**

Subscribing to a **JBoss Enterprise Application Platform** entitlement pool does not enable the JBoss Enterprise Application Platform repository. By default this software repository is disabled. The JBoss Enterprise Application Platform software repository must be enabled using the **yum-config-manager** command as the **root** user:

```
# yum-config-manager --enable jb-eap-6-for-rhel-6-server-rpms
```

#### Result

The system is now registered with Red Hat Network and subscribed to the channels required for Red Hat Enterprise Virtualization Manager installation.

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### 3.3.2. Subscribing to the Red Hat Enterprise Virtualization Manager Channels using RHN Classic

**Note**

Refer to the *Red Hat Enterprise Virtualization Manager Release Notes* for specific channel names current to your system.

#### Summary

To install Red Hat Enterprise Virtualization Manager you must first register the target system to Red Hat Network and subscribe to the required software channels.

**Procedure 3.2. Subscribing to the Red Hat Enterprise Virtualization Manager Channels using RHN Classic**

1. Run the **rhn_register** command to register the system with Red Hat Network. To complete registration successfully you will need to supply your Red Hat Network username and password. Follow the onscreen prompts to complete registration of the system.

   ```
   # rhn_register
   ```

2. **Subscribe to Required Channels**

   You must subscribe the system to the required channels using either the web interface to Red Hat Network or the command line **rhn-channel** command.

   A. **Using the rhn-channel Command**

   Run the **rhn-channel** command to subscribe the system to each of the required channels. The commands which need to be run are:

   ```
   # rhn-channel --add --channel=rhel-x86_64-server-6
   # rhn-channel --add --channel=rhel-x86_64-server-supplementary-6
   # rhn-channel --add --channel=rhel-x86_64-server-6-rhevm-version.number
   # rhn-channel --add --channel=jbappplatform-6-x86_64-server-6-rpm
   ```

**Important**

If you are not the administrator for the machine as defined in Red Hat Network, or the machine is not registered to Red Hat Network, then use of the **rhn-channel** command will result in an error:

```
Error communicating with server. The message was:
Error Class Code: 37
Error Class Info: You are not allowed to perform administrative tasks
on this system.
Explanation:
     An error has occurred while processing your request. If this
problem
     persists please enter a bug report at bugzilla.redhat.com.
     If you choose to submit the bug report, please be sure to
include
     details of what you were trying to do when this error occurred
and
     details on how to reproduce this problem.
```

If you encounter this error when using **rhn-channel** then to add the channel to the system you must use the web user interface.

B. **Using the Web Interface to Red Hat Network**

To add a channel subscription to a system from the web interface:

a. Log on to Red Hat Network (http://rhn.redhat.com).

b. Move the mouse cursor over the **Subscriptions** link at the top of the screen, and then click the **Registered Systems** link in the menu that appears.

c. Select the system to which you are adding channels from the list presented on the screen, by clicking the name of the system.

d. Click **Alter Channel Subscriptions** in the **Subscribed Channels** section of the screen.

e. Select the channels to be added from the list presented on the screen. Red Hat Enterprise Virtualization Manager requires:

- the **Red Hat Enterprise Linux Server (v. 6 for 64-bit x86_64)** channel,
- the **RHEL Server Supplementary (v. 6 64-bit x86_64)** channel,
- the **Red Hat Enterprise Virtualization Manager (*version.number* x86_64)** channel, and
- the **Red Hat JBoss EAP (v 6) for 6Server x86_64** channel.

f. Click the **Change Subscription** button to finalize the change.

### Result

The system is now registered with Red Hat Network and subscribed to the channels required for Red Hat Enterprise Virtualization Manager installation.

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## 3.4. Installing the Red Hat Enterprise Virtualization Manager Packages

**Prerequisites:**

- Section 3.3, “Subscribing to the Red Hat Enterprise Virtualization Channels”

### Summary

The Red Hat Enterprise Virtualization Manager and all of its dependencies are available via Red Hat Network. To install the Manager you must ensure connectivity with either Red Hat Network or a Red Hat Network Satellite Server is available. You must also ensure that you have access to all required Red Hat Network channels.

**Procedure 3.3. Installing the Red Hat Enterprise Virtualization Manager Packages**

1. Use **yum** to ensure that the most up to date versions of all installed packages are in use.

```
# yum upgrade
```

2. Use **yum** to initiate installation of the *rhevm* package and all dependencies. You must run this command as the **root** user.

```
# yum install rhevm
```

**Note**

Installing the *rhevm* package also installs all packages which it depends on. This includes the *java-1.7.0-openjdk* package. The *java-1.7.0-openjdk* package provides the OpenJDK Java Virtual Machine (JVM) required to run Red Hat Enterprise Virtualization Manager.

3. The *rhevm* package includes the *rhevm-doc* package as a dependency. The *rhevm-doc* package provides a local copy of the Red Hat Enterprise Virtualization documentation suite. This documentation is also used to provide context sensitive help links from the Administration and User Portals.

   As localized versions of this package become available they will be released to Red Hat Network. Follow these steps to find and install any available localized Red Hat Enterprise Virtualization documentation packages that you require:

   a. Use the **yum** command to search for translated Red Hat Enterprise Virtualization Manager documentation packages:

```
# yum search rhevm-doc
```

   b. While logged in as the **root** user use the **yum** command to install translated Red Hat Enterprise Virtualization Manager documentation packages. Here the Japanese (**ja-JP**) version of the package is installed:

```
# yum install rhevm-doc-ja-JP
```

### Result

All required packages and dependencies are installed. The required Java runtime environment was also

selected as the default for the system. You must now configure the Red Hat Enterprise Virtualization Manager.

**See Also:**

- Section 3.5, “Configuring Red Hat Enterprise Virtualization Manager”
- Section 5.2, “Updating Red Hat Enterprise Virtualization Manager”
- Section 3.7, “Removing Red Hat Enterprise Virtualization Manager”

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## 3.5. Configuring Red Hat Enterprise Virtualization Manager

**Prerequisites:**

- Section 3.4, “Installing the Red Hat Enterprise Virtualization Manager Packages”

### Summary

Once package installation is complete the Red Hat Enterprise Virtualization Manager must be configured. The **rhevm-setup** command is provided to assist with this task. The script asks you a series of questions, the answers to which form the basis for system configuration. Once all required values have been provided the updated configuration is applied and the Red Hat Enterprise Virtualization Manager services are started.

**Procedure 3.4. Configuring Red Hat Enterprise Virtualization Manager**

1. **Start setup script**

   To begin configuring the system run **rhevm-setup** as the **root** user.

   ```
   # rhevm-setup
   ```

2. **Stop ovirt-engine**

   To install Red Hat Enterprise Virtualization Manager the JBoss Enterprise Application Platform needs to first be stopped. Stopping this service allows it to be configured for use with the Manager. Type **yes** to stop the service and proceed with Manager installation.

   ```
   In order to proceed the installer must stop the ovirt-engine service
   Would you like to stop the ovirt-engine service? (yes|no): yes
   ```

3. **Override Apache configuration**

   Red Hat Enterprise Virtualization uses the **mod_proxy** module for the Apache web server (**httpd**) to redirect network traffic from the HTTP and HTTPS ports which you select, to the application server that the Manager runs on. If the **rhevm-setup** script detects an existing **httpd** configuration then you will need to decide whether or not to override it:

   ```
   RHEV Manager uses httpd to proxy requests to the application server.
   It looks like the httpd installed locally is being actively used.
   The installer can override current configuration .
   Alternatively you can use JBoss directly (on ports higher than 1024)
   Do you wish to override current httpd configuration and restart the service?
   ['yes'| 'no']  [yes] :
   ```

   A. If you do not receive this message, there is no existing **httpd** configuration on the system and

the script will move to the next step.

B. If you do receive this message, you must:
   - enter **yes** if you wish to configure the Manager to listen to HTTP and/or HTTPS ports lower than port **1024**; or
   - enter **no** if you do not wish to configure the Manager to listen to HTTP and/or HTTPS ports lower than port **1024**, leaving the existing **httpd** configuration intact.

4. **Set Port for HTTP**

   The script prompts for entry of the port to use for HTTP communication. To use the default value, **80**, press **Enter**. To use an alternative value enter it in the field, and then press **Enter**.

   ```
   HTTP Port  [80] :
   ```

   The port you select also appears in the URL that must be used to access the Red Hat Enterprise Virtualization Manager over HTTP.

5. **Set Port for HTTPS**

   The script prompts for entry of the port to use for HTTPS communication. To use the default value, **443**, press **Enter**. To use an alternative value enter it in the field, and then press **Enter**.

   ```
   HTTPS Port  [443] :
   ```

   Where a port other than **443** is selected it changes the URL that must be used to access the Red Hat Enterprise Virtualization Manager over HTTPS.

6. **Set Fully Qualified Domain Name (FQDN)**

   The script prompts for entry of the system's fully qualified domain name. This name should be resolvable via both forward and reverse DNS lookup. The script attempts to determine the fully qualified domain name automatically. The value identified is listed in square brackets as the default setting for the fully qualified domain name, based on your setup.

   ```
   Host fully qualified domain name. Note: this name should be fully resolvable
   [rhevm31.demo.redhat.com] :
   ```

   Where the automatically determined fully qualified domain name is correct, press **Enter** to use the value and continue. Where the automatically determined fully qualified domain name is not correct, enter the correct value and press **Enter** to use the new value and continue.

   Your fully qualified domain name should have both forward and reverse lookup records in DNS, especially if will also install the reports server.

7. **Set Administrator Password**

   The script creates an authentication domain internal to the Red Hat Enterprise Virtualization Manager for the default administrative account. The domain is named **internal**, the administrative user is called **admin**. External authentication domains are added as a post-installation step using the **rhevm-manage-domains** command.

   You must choose a password for the **admin** user. You will be asked to enter it a second time to confirm your selection.

   ```
   Password for Administrator (admin@internal) :
   ```

8. **Set Organization Name**

   The script prompts for entry of the Organization Name. The Organization Name appears in the **Subject** field of the certificate used to secure communications with the Red Hat Enterprise Virtualization Manager.

```
Organization Name for the Certificate [demo.redhat.com] :
```

9. **Configure Default Storage Type**

   The script prompts for selection of the default storage type. This is the storage type that is used for the **Default** data center. You are able to add further data centers that use different storage types from the Administration Portal at any time.

   ```
   The default storage type you will be using  ['NFS'| 'FC'| 'ISCSI'| 'POSIXFS']
   [NFS] :
   ```

   The default selection is Network File System (**NFS**). The other available values are:

   - POSIX compliant filesystems (**POSIXFS**),
   - Fibre Channel (**FC**), and
   - Internet Small Computer System Interface (**ISCSI**).

   The **POSIXFS**, **NFS**, **FC**, and **ISCSI** options are used to connect to remote storage. **POSIXFS** is especially for GlusterFS data domains, but can be used for other POSIX compliant filesystems. Red Hat Enterprise Virtualization also supports the **LOCALFS** storage type which allows the use of local storage attached to the virtualization hosts. The **LOCALFS** storage type is not however a supported choice for use in the **Default** data center.

   To use the default selection, **NFS**, press **Enter**. Otherwise, enter the desired value.

10. **Select database location**

    Red Hat Enterprise Virtualization supports the use of a local database on the management system, or a remote database provided elsewhere in your environment. The setup script prompts you to indicate whether you wish to use a local database, which is the default option, or a remote database:

    ```
    Enter DB type for installation ['remote'| 'local']  [local] :
    ```

    A. Enter **local** to have the setup script create a local PostgreSQL database server for the Manager.

       The script prompts for entry of a password to use for the local Red Hat Enterprise Virtualization Manager database. Enter the desired password. You will be asked to enter the password again to confirm it.

       ```
       Database password (required for secure authentication with the locally
       created database) :
       ```

    B. Enter **remote** to have the script use a remote database server for the Manager.

       a. You will be prompted to provide:
          - the IP address or hostname of the remote database server,
          - the port number on which the remote database server is listening,
          - the administrative user name for the remote database server, and
          - the administrative user's password.

       The database server that you specify must be configured to allow remote connections. Additionally, the database user that you select must have the permissions required to create databases on the remote database server.

**Important**

Your remote database server must have the **uuid-ossp** Postgres extension loaded. You can load it like this

```
psql -U postgres -d template1 -f /usr/share/pgsql/contrib/uuid-ossp.sql
```

Once loaded, every subsequent database created includes the functions provided by the extension.

```
Enter DB type for installation ['remote'| 'local']  [local] : remote
Enter the host IP or host name where DB is running:
database.demo.redhat.com
Enter DB port number  [5432] : 5432
Enter DB admin user name  [postgres] :
Remote database password :
Confirm password :
```

b. **Secure connection**

You can configure Red Hat Enterprise Virtualization Manager to use a secure connection, encrypted using SSL when connecting to the remote database server. You *must* ensure that the remote database server is configured to support secure connections before enabling them.

```
Configure secure connection? (make sure SSL is configured on remote database) ['yes'| 'no']  [no] :
```

Enter **yes** to use secure database connections.

The setup script will connect to the remote database server to verify the details that you provided are correct.

11. **Configure NFS ISO Domain**

The script asks whether or not an NFS share should be configured on the server and used as an ISO storage domain.

```
Configure NFS share on this server to be used as an ISO Domain? ['yes'| 'no'] [yes] :
```

An ISO storage domain is used to store copies of removable media for use when provisioning and using virtual machines. The Red Hat Enterprise Virtualization Manager is able to use either an ISO storage domain on the system it is installed to or one that exists on remote storage. In either case the ISO storage domain must be accessible via NFS. The ability to configure an ISO storage domain is also available from the Administration Portal after installation.

To take the default action, which is to configure an NFS share for use as an ISO storage domain, press **Enter**. To skip this step type **no** and press **Enter**.

If you chose to configure an NFS share then you will also need to provide both a path and a display name for it. The path is the location on the local file system where the NFS share must be created. The directory must not already exist.

```
Local ISO domain path  [/usr/local/exports/iso] :
```

The ISO domain will be created and exported as an NFS share. It will be shown as active in the Red Hat Enterprise Virtualization Manager once the first active virtualization host has been added to the **Default** data center.

12. **Configure Firewall**

    The Red Hat Enterprise Virtualization Manager requires that network traffic on a number of ports be allowed through the system's firewall. The **rhevm-setup** script is able to configure this automatically, but selecting this option overrides any existing firewall configuration. Where there is an existing firewall configuration that needs to be maintained you must manually configure the firewall to include the additional rules required by the Red Hat Enterprise Virtualization Manager.

    ```
    The installer can configure firewall automatically overriding the current
    configuration. The old configuration will be backed up.
    Alternately you can configure the firewall later using an example file.
    Which firewall do you wish to configure? ['None'| 'iptables']:
    ```

    A. To proceed with automatic firewall configuration type **iptables** and then press **Enter**.

    B. To skip automatic firewall configuration type **None** and then press **Enter**. You will need to add rules equivalent to those found in **/etc/ovirt-engine/iptables.example** to your **iptables** configuration.

13. **Confirm Configuration**

    You have now provided the script with all the information required to complete configuration of the Red Hat Enterprise Virtualization Manager. The values which you entered are displayed for confirmation.

    **Example 3.2. Configuration Confirmation Screen**

    ```
    RHEV Manager will be installed using the following configuration:
    ==================================================================
    override-httpd-config:         yes
    http-port:                     80
    https-port:                    443
    host-fqdn:                     rhev-manager1.redhat.com
    auth-pass:                     ********
    org-name:                      Red Hat
    default-dc-type:               NFS
    db-remote-install:             local
    db-local-pass:                 ********
    config-nfs:                    no
    override-firewall:             iptables
    Proceed with the configuration listed above? (yes|no): yes
    ```

    A. To permanently apply the configuration values listed type **yes** and then press **Enter** to apply the configuration.

    B. If one or more of the configuration values listed is incorrect type **no** and then **Enter** to revisit the configuration.

    The configuration values are applied. A number of services need to be started and as a result this step takes some time. Do not terminate the installation once application of the configuration values has commenced.

    Once the script has completed successfully take note of the additional information it provides. In particular note down the **SSH Certificate fingerprint**, **SSH Public key fingerprint**, and Red Hat Enterprise Virtualization Manager URL for your records.

**Example 3.3. Successful Configuration**

```
Installing:
Configuring RHEV Manager...                                   [ DONE ]
Configuring JVM...                                            [ DONE ]
Creating CA...                                                [ DONE ]
Updating ovirt-engine service...                              [ DONE ]
Setting Database Configuration...                             [ DONE ]
Setting Database Security...                                  [ DONE ]
Creating Database...                                          [ DONE ]
Updating the Default Data Center Storage Type...              [ DONE ]
Editing RHEV Manager Configuration...                         [ DONE ]
Editing Postgresql Configuration...                           [ DONE ]
Configuring Firewall...                                       [ DONE ]
Starting ovirt-engine Service...                              [ DONE ]
Configuring HTTPD...                                          [ DONE ]

 **** Installation completed successfully ******

     (Please allow RHEV Manager a few moments to start up.....)

**** To access RHEV Manager browse to http://rhev-manager1.redhat.com:80
****

Additional information:
 * There are less than 4096 MBs of available free memory on this machine.
It is  recommended to have at least 4096 MBs of available memory to run
the RHEV Manager.
 * RHEV Manager CA SSL Certificate SHA1 fingerprint:
6C:5C:32:0E:C8:17:B9:90:7D:F5:80:A2:D3:63:47:85:36:C9:DC:18
 * SSH Public key fingerprint:
d2:08:bc:66:cb:19:79:70:4d:52:5b:cc:39:b2:dc:38
 * The installation log file is available at: /var/log/ovirt-engine/engine-
setup_2013_03_07_12_16_40.log
 * Please use the user "admin" and password specified in order to login
into RHEV Manager
 * To configure additional users, first configure authentication domains
using the 'rhevm-manage-domains' utility
```

### Result

The Red Hat Enterprise Virtualization Manager has been installed and configured successfully. You are now able to connect to the Administration Portal for the first time.

**See Also:**

- Section 3.6, “Connecting to the Administration Portal”

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## 3.6. Connecting to the Administration Portal

**Prerequisites:**

- Section 3.5, “Configuring Red Hat Enterprise Virtualization Manager”
- Section 2.3.2, “Red Hat Enterprise Virtualization Manager Client Requirements”

### Summary

Access the Administration Portal using a web browser.

**Procedure 3.5. Connecting to the Administration Portal**

1. Open a supported web browser on your client system.
2. Navigate to **https://*rhevm31.demo.redhat.com*/webadmin**.

**Note**

Replace **rhevm31.demo.redhat.com** with the fully qualified domain name that you provided during installation. Additionally where a non-default HTTPS port was selected during installation, it must be appended to the domain name. For example if the HTTPS port selected during installation was **8443** then the URL would become **https://*rhevm31.demo.redhat.com*:*8443*/webadmin**.

3. The first time that you connect, you will be prompted to trust the certificate being used to secure communications between your browser and the web server.
4. The login screen is displayed. Enter your **User Name** and **Password** in the fields provided. If you are logging in for the first time, use the user name **admin** in conjunction with the administrator password that you specified during installation.
5. Select the directory services domain to authenticate against from the **Domain** list provided. If you are logging in using the internal **admin** user name, then select the **internal** domain.
6. The Administration Portal is available in multiple languages. The default selection will be chosen based on the locale settings of your web browser. If you would like to view the Administration Portal in a language other than that selected by default, select your preferred language from the list.
7. Click **Login** to log in.

### Result

You have now successfully logged into the Administration Portal.

**See Also:**

- Chapter 4, *Data Collection Setup and Reports Installation*
- Part III, “Installing Virtualization Hosts”

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## 3.7. Removing Red Hat Enterprise Virtualization Manager

### Summary

The Red Hat Enterprise Virtualization Manager provides the **rhevm-cleanup** utility to allow quick and easy removal of the data files associated with the installation. Once this has been run you are able to remove the Red Hat Enterprise Virtualization Manager packages using **yum**.

**Warning**

The **rhevm-cleanup** command removes all existing Red Hat Enterprise Virtualization Manager data. This includes configuration settings, certificates, and database tables.

**Procedure 3.6. Removing Red Hat Enterprise Virtualization Manager**

1. Run the **rhevm-cleanup** command on the system that Red Hat Enterprise Virtualization Manager is installed on. You must be logged in as the **root** user to run **rhevm-cleanup**.

```
# rhevm-cleanup
```

2. The script prompts you to confirm that you wish to remove Red Hat Enterprise Virtualization Manager.

```
Would you like to proceed? (yes|no): yes
```

   Type **yes** and then press **Enter** to proceed with removal of Red Hat Enterprise Virtualization Manager.

3. The **rhevm-cleanup** command displays a message confirming that the Red Hat Enterprise Virtualization data files have been removed successfully.

```
RHEV Manager cleanup finished successfully!
```

   To complete removal of the Red Hat Enterprise Virtualization Manager you must also use **yum** to remove the relevant packages. While still logged in as the **root** user run:

```
# yum remove rhevm* vdsm-bootstrap
```

**Result**

Red Hat Enterprise Virtualization Manager has been removed from the system successfully.

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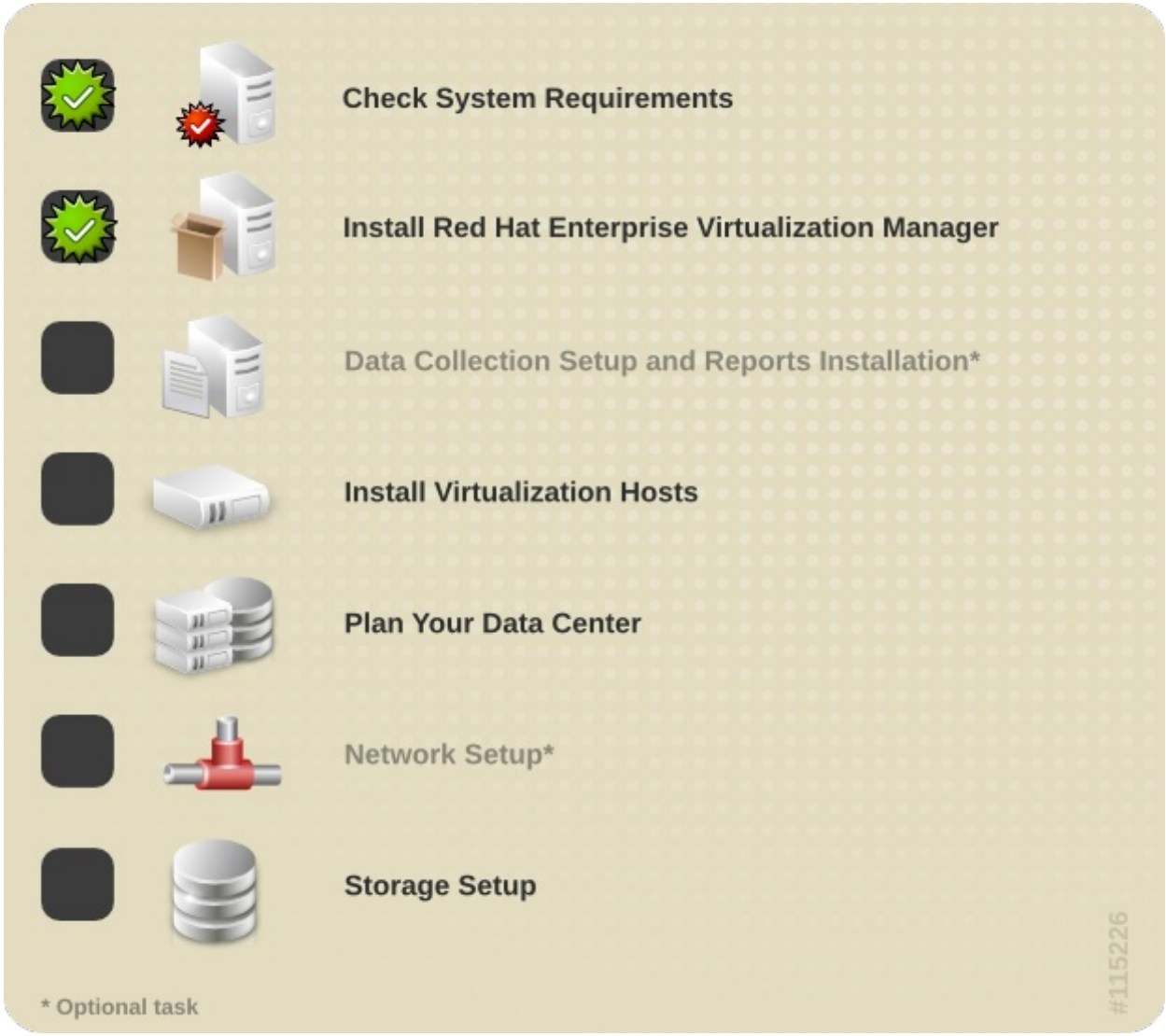
# Chapter 4. Data Collection Setup and Reports Installation

## 4.1. Workflow Progress — Data Collection Setup and Reports Installation

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## 4.2. Data Collection Setup and Reports Installation Overview

The Red Hat Enterprise Virtualization Manager optionally includes a comprehensive management history database, which can be utilized by any application to extract a range of information at the data center, cluster, and host levels. As the database structure changes over time a number of database views are also included to provide a consistent structure to consuming applications. A view is a virtual table composed of the result set of a database query. The definition of a view is stored in the database as a **`SELECT`** statement. The result set of the **`SELECT`** statement populates the virtual table returned by the view. If the optional comprehensive management history database has been enabled, the history tables and their associated views are stored in the **`rhevm_history`** database.

In addition to the history database Red Hat Enterprise Virtualization Manager Reports functionality is also available as an optional component. Red Hat Enterprise Virtualization Manager Reports provides a customized implementation of JasperServer, and JasperReports. JasperServer is a component of

JasperReports, an open source reporting tool capable of being embedded in Java-based applications. It produces reports which can be rendered to screen, printed, or exported to a variety of formats including PDF, Excel, CSV, Word, RTF, Flash, ODT and ODS. Reports built in Red Hat Enterprise Virtualization Manager Reports are accessed via a web interface. In addition to a range of pre-configured reports and dashboards for monitoring the system, you are also able to create your own ad hoc reports.

Before proceeding with Red Hat Virtualization Manager Reports installation you must first have installed the Red Hat Enterprise Virtualization Manager.

The Red Hat Enterprise Virtualization Manager Reports functionality depends on the presence of the history database, which is installed separately. Both the history database and the Red Hat Enterprise Virtualization Manager Reports are optional components. They are not installed by default when you install the Red Hat Enterprise Virtualization Manager.

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## 4.3. Installing and Configuring the History Database

**Prerequisites:**

- Section 3.4, “Installing the Red Hat Enterprise Virtualization Manager Packages”
- Section 3.5, “Configuring Red Hat Enterprise Virtualization Manager”

### Summary

The history database is optional. If you wish to use the history or reporting capabilities of Red Hat Enterprise Virtualization Manager then you must install and configure the history database.

**Procedure 4.1. Installing and Configuring the History Database**

1. **Install Required Packages**

   Use **yum** to initiate installation of the *rhevm-dwh* package, or the *rhevm-reports* package if you also intend to install Red Hat Enterprise Virtualization Manager Reports. You must run this command as the **root** user on the system hosting the Red Hat Enterprise Virtualization Manager.

   A. To install only the data warehouse package:

   ```
   # yum install rhevm-dwh
   ```

   B. To install both the data warehouse package and the Red Hat Enterprise Virtualization Manager Reports package:

   ```
   # yum install rhevm-reports
   ```

2. **Confirm Package Installation**

   The required packages are downloaded. Once all packages have been downloaded they are listed for review. You will be prompted to confirm that you wish to continue with the installation. Once you have confirmed the operation **yum** installs the packages. Some further configuration is, however, required before the reports functionality can be used.

3. **Configure History Database**

   You need to use the **rhevm-dwh-setup** command to configure the Extract, Transform, Load (ETL) process and database scripts used to create and maintain a working history database.

   a. You must run this command as the **root** user on the system hosting the Red Hat Enterprise Virtualization Manager.

```
# rhevm-dwh-setup
```

b. For the history database installation to take effect it is necessary to restart the **ovirt-engine** service. The **rhevm-dwh-setup** command asks you:

```
Would you like to stop the ovirt-engine service? (yes|no):
```

Type **yes** and then press **Enter** to proceed. The command then:

- Stops the **ovirt-engine** service.
- Creates and configures the **rhevm_history** database.
- Starts the **ovirt-engine** service.

### Result

The **rhevm_history** database has been created. Red Hat Enterprise Virtualization Manager is configured to log information to this database for reporting purposes.

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## 4.4. Installing and Configuring Red Hat Enterprise Virtualization Manager Reports

**Prerequisites:**

- Section 4.3, “Installing and Configuring the History Database”

### Summary

The *rhevm-reports* package is optional. If you wish to use the reporting capabilities of Red Hat Enterprise Virtualization Manager then you must install and configure the *rhevm-reports*.

**Procedure 4.2. Installing and Configuring Red Hat Enterprise Virtualization Manager Reports**

1. Use **yum** to install the Red Hat Enterprise Virtualization Manager Reports package, *rhevm-reports*, if you did not already do this when performing the datawarehouse installation. This package must be installed on the system that the Red Hat Enterprise Virtualization Manager is installed. You must be logged in as the **root** user.

```
# yum install rhevm-reports
```

2. You must run this command as the **root** user on the system hosting the Red Hat Enterprise Virtualization Manager.

```
# rhevm-reports-setup
```

3. For the Red Hat Enterprise Virtualization Manager Reports installation to take effect it is necessary to restart the **ovirt-engine** service. The **rhevm-reports-setup** command asks you:

```
In order to proceed the installer must stop the ovirt-engine service
Would you like to stop the ovirt-engine service? (yes|no):
```

Type **yes** and then press **Enter** to proceed. The command then performs a number of actions

before prompting you to set the password for the Red Hat Enterprise Virtualization Manager Reports administrative users (**rhevm-admin** and **superuser**). Note that the reports system maintains its own set of credentials which are separate to those used for Red Hat Enterprise Virtualization Manager.

```
Please choose a password for the admin users (rhevm-admin and superuser):
```

You will be prompted to enter the password a second time to confirm it.

### Result

Red Hat Enterprise Virtualization Manager Reports have been installed successfully. Access Red Hat Enterprise Virtualization Manager Reports at **http://*demo.redhat.com*/rhevm-reports**, replacing ***demo.redhat.com*** with the fully qualified domain name of the Red Hat Enterprise Virtualization Manager. If during Red Hat Enterprise Virtualization Manager installation you selected a non-default HTTP port then append **:*port*** to the URL, replacing ***port*** with the port that you chose.

Use the username **rhevm-admin** and the password you set during reports installation to log in for the first time. Note that the first time you log into Red Hat Enterprise Virtualization Manager Reports a number of web pages are generated, as a result your initial attempt to login may take some time to complete.

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# Chapter 5. Updating Red Hat Enterprise Virtualization between Minor Releases

## 5.1. Checking for Red Hat Enterprise Virtualization Manager Updates

### Summary

Use the **rhevm-check-update** command, included in Red Hat Enterprise Virtualization Manager, to check for updates.

**Procedure 5.1. Checking for Red Hat Enterprise Virtualization Manager Updates**

1. Run **rhevm-check-update** as the **root** user.

```
# rhevm-check-update
```

2. A. Where no updates are available the command will output the text **No updates available**.

```
# rhevm-check-update
Loaded plugins: product-id, versionlock
Checking for updates... (This may take several minutes)
No updates available
```

   B. Where updates are available the command will list the packages to be updated.

```
# rhevm-check-update
Loaded plugins: product-id
Checking for updates... (This may take several minutes)
10 Updates available:
 * rhevm-3.2.0-10.14.beta1.el6ev.noarch
 * rhevm-backend-3.2.0-10.14.beta1.el6ev.noarch
 * rhevm-config-3.2.0-10.14.beta1.el6ev.noarch
 * rhevm-dbscripts-3.2.0-10.14.beta1.el6ev.noarch
 * rhevm-genericapi-3.2.0-10.14.beta1.el6ev.noarch
 * rhevm-notification-service-3.2.0-10.14.beta1.el6ev.noarch
 * rhevm-restapi-3.2.0-10.14.beta1.el6ev.noarch
 * rhevm-tools-common-3.2.0-10.14.beta1.el6ev.noarch
 * rhevm-userportal-3.2.0-10.14.beta1.el6ev.noarch
 * rhevm-webadmin-portal-3.2.0-10.14.beta1.el6ev.noarch
```

### Result

You have successfully checked for Red Hat Enterprise Virtualization Manager updates.

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## 5.2. Updating Red Hat Enterprise Virtualization Manager

### Summary

Updates to the Red Hat Enterprise Virtualization Manager are released via Red Hat Network. Before installing an update from Red Hat Network be sure to read the advisory text associated with it as well as

the most recent version of the *Red Hat Enterprise Virtualization — Release Notes*, and the *Red Hat Enterprise Virtualization — Technical Notes*. To complete an upgrade a number of actions must be performed including:

- stopping the **ovirt-engine** service,
- downloading and installing the updated packages,
- backing up and updating the database,
- performing post installation configuration, and
- restarting the **ovirt-engine** service.

A script is included to perform these actions for you in an automated fashion. Active virtualization hosts are not upgraded by this process and must be updated separately. As a result the virtual machines running upon them are not affected. All commands in this task must be run while logged into the system hosting Red Hat Enterprise Virtualization Manager as the **root** user.

**Procedure 5.2. Updating Red Hat Enterprise Virtualization Manager**

1. Run the **yum** command to update the *rhevm-setup* package.

```
# yum update rhevm-setup
```

2. Run the **rhevm-upgrade** command to update the Red Hat Enterprise Virtualization Manager.

```
# rhevm-upgrade
```

**Note**

Be aware that the upgrade process may take some time. Allow time for the upgrade process to complete and do not stop it once initiated. Once the upgrade has been completed you will also be instructed to separately upgrade the data warehouse and reports functionality. These additional steps are only required if these optional packages are installed.

### Result

You have successfully updated Red Hat Enterprise Virtualization Manager.

**See Also:**

- Section 5.3, “Updating Red Hat Enterprise Virtualization Manager Reports”

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## 5.3. Updating Red Hat Enterprise Virtualization Manager Reports

### Summary

The Red Hat Enterprise Virtualization Manager Reports must be updated separately to the Red Hat Enterprise Virtualization Manager. This task provides instructions for updating both the history database and the reporting engine. You must run all commands in this task while logged into the system hosting Red Hat Enterprise Virtualization Manager as the **root** user.

**Procedure 5.3. Updating Red Hat Enterprise Virtualization Manager Reports**

1. Use the **yum** command to update the *rhevm-reports* and *rhevm-dwh* packages.

```
# yum update -y rhevm-reports rhevm-dwh
```

2. Run the **rhevm-dwh-setup** command to update the **rhevm_history** database.

```
# rhevm-dwh-setup
```

3. Run the **rhevm-reports-setup** command to update the reporting engine.

```
# rhevm-reports-setup
```

### Result

You have successfully updated the Red Hat Enterprise Virtualization Manager Reports.

**See Also:**

- Section 5.2, “Updating Red Hat Enterprise Virtualization Manager”

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## 5.4. Updating Red Hat Enterprise Virtualization Hypervisors

### Summary

Updating Red Hat Enterprise Virtualization Hypervisors involves reinstalling the Hypervisor with a newer version of the Hypervisor ISO image. This includes stopping and restarting the Hypervisor. Virtual machines are automatically migrated to a different host, as a result it is recommended that Hypervisor updates are performed at a time when the host's usage is relatively low.

It is recommended that administrators update Red Hat Enterprise Virtualization Hypervisors regularly. Important bug fixes and security updates are included in updates. Hypervisors which are not up to date may be a security risk.

**Warning**

Upgrading Hypervisor hosts involves shutting down, deactivating guests, and restarting the physical server. If any virtual machines are running on the Hypervisor, all data and configuration details may be destroyed if they are not shut down. Upgrading Hypervisors must be carefully planned and executed with care and consideration.

**Important**

Ensure that the cluster contains more than one host before performing an upgrade. Do not attempt to re-install or upgrade all the hosts at the same time, as one host must remain available to perform Storage Pool Manager (SPM) tasks.

**Procedure 5.4. Updating Red Hat Enterprise Virtualization Hypervisors**

1. Log in to the system hosting Red Hat Enterprise Virtualization Manager as the **root** user.
2. Ensure that:
   - the system is subscribed to the **Red Hat Enterprise Virtualization** entitlement — if using certificate-based Red Hat Network; or
   - the system is subscribed to the **Red Hat Enterprise Virtualization Hypervisor (v.6 x86-64)** (labeled **rhel-x86_64-server-6-rhevh**) — if using classic Red Hat Network.
3. Run the **yum** command with the ***update rhev-hypervisor6*** parameters to ensure that you have the most recent version of the *rhev-hypervisor6* package installed.

   ```
   # yum update rhev-hypervisor6
   ```

4. Use your web browser to log in to the Administration Portal as a Red Hat Enterprise Virtualization administrative user.
5. Click the **Hosts** tab, and then select the host that you intend to upgrade. If the host is not displayed, or the list of hosts is too long to filter visually, perform a search to locate the host.
6. With the host selected, click the **General** tab on the **Details** pane.
   A. If the host requires updating, an alert message indicates that a new version of the Red Hat Enterprise Virtualization Hypervisor is available.
   B. If the host does not require updating, no alert message is displayed and no further action is required.
7. Ensure the host remains selected and click the **Maintenance** button, if the host is not already in maintenance mode. This will cause any virtual machines running on the host to be migrated to other hosts. If the host is the SPM, this function will be moved to another host. The status of the host changes as it enters maintenance mode. When the host status is **Maintenance**, the message in the general tab changes, providing you with a link which when clicked will re-install or upgrade the host.
8. Ensure that the host remains selected, and that you are on the **General** tab of the the **Details** pane. Click the **Upgrade** link. The **Install Host** dialog box displays.
9. Select **rhev-hypervisor.iso**, which is symbolically linked to the most recent hypervisor image.
10. Click **OK** to update and re-install the host. The dialog closes, the details of the host are updated in the **Hosts** tab, and the status changes.

    The host status will transition through these stages:
    - **Installing**,
    - **Reboot**,
    - **Non Responsive**, and
    - **Up**.

    These are all expected, and each stage will take some time.
11. Once successfully updated, the host displays a status of **Up**. Any virtual machines that were migrated off the host, are at this point able to be migrated back to it.

### Result

You have successfully updated a Red Hat Enterprise Virtualization Hypervisor. Repeat these steps for each Hypervisor in the Red Hat Enterprise Virtualization environment.

**See Also:**

- Section 5.5, “Updating Red Hat Enterprise Linux Virtualization Hosts”

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## 5.5. Updating Red Hat Enterprise Linux Virtualization Hosts

### Summary

Red Hat Enterprise Linux virtualization hosts are updated the same way as regular Red Hat Enterprise Linux systems, using **yum**. It is highly recommended that you use **yum** to update your systems regularly, to ensure timely application of security and bug fixes. All steps in this task must be run while logged into the Red Hat Enterprise Linux virtualization host as the **root** user.

**Procedure 5.5. Updating Red Hat Enterprise Linux Virtualization Hosts**

1. On the administration portal, navigate to the **Hosts** tab and select the host to be updated. Click **Maintenance** to place it into maintenance mode.
2. On the Red Hat Enterprise Linux virtualization host, run the **yum** command with the ***update*** parameter to update all installed packages.

   ```
   # yum update
   ```

3. If a package such as the kernel was updated, you must reboot the host to get the new functionality. If a package such as VDSM or libvirt was updated, you must restart that service to get the new functionality.

### Result

You have successfully updated the Red Hat Enterprise Linux virtualization host. Repeat this process for each Red Hat Enterprise Linux virtualization host in the Red Hat Enterprise Virtualization environment.

**See Also:**

- Section 5.4, “Updating Red Hat Enterprise Virtualization Hypervisors”

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## 5.6. Updating the Red Hat Enterprise Virtualization Guest Tools

### Summary

The guest tools allow the Manager to communicate with running guests, providing information like IP addresses, memory usage, and installed applications for display in the Administration Portal. The guest tools are distributed as an ISO file that can be attached to guests. The ISO file is packaged as an RPM file, that can be installed and upgraded on registered Red Hat Enterprise Manager servers.

**Procedure 5.6. Updating the Red Hat Enterprise Virtualization Guest Tools**

1. On the Manager, as root user, use the **yum upgrade** to upgrade the **rhev-guest-tools-iso** package.

```
# yum update -y rhev-guest-tools-iso*
```

2. When the **rhev-guest-tools-iso** package has been successfully upgraded, use the **rhevm-iso-uploader** to upload it to your ISO storage domain. Replace ***ISODomain*** with the name of your ISO storage domain.

```
rhevm-iso-uploader --iso-domain=ISODomain upload /usr/share/rhev-guest-tools-iso/rhev-tools-setup.iso
```

   The **rhev-tools-setup.iso** file is actually a link to the most recently updated ISO file. The link is automatically changed to point to the newest ISO file every time you upgrade the **rhev-guest-tools-iso** package.

3. Using the web portal or REST API, attach the rhev-tools-setup.iso file to each of your guests, and from within each guest, upgrade the tools installed on each guest using the installer on the ISO.

**Result**

You've updated your **rhev-tools-setup.iso** file, uploaded the updated ISO to your ISO storage domain, and attached it to your virtual machines.

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# Chapter 6. Upgrading to Red Hat Enterprise Virtualization 3.2

## 6.1. Upgrading 2.2 Compatible Clusters in Preparation for Upgrade

### 6.1.1. Changing the Data Center Compatibility Version

#### Summary

Red Hat Enterprise Virtualization data centers have a compatibility version. The compatibility version indicates the version of Red Hat Enterprise Virtualization that the data center is intended to be compatible with. All clusters in the data center must support the desired compatibility level.

**Procedure 6.1. Changing the Data Center Compatibility Version**

1. Log in to the Administration Portal as the administrative user. By default this is the **admin** user.
2. Click the **Data Centers** tab.
3. Select the data center that you wish to change from the list displayed. If the list of data centers is too long to filter visually then perform a search to locate the desired data center.
4. Click the **Edit** button.
5. Change the **Compatibility Version** to the desired value.
6. Click **OK**.

#### Result

You have updated the compatibility version of the data center.

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## 6.2. Upgrading to Red Hat Enterprise Virtualization Manager 3.2

**Prerequisites:**

- Section 6.3, “Upgrading to Red Hat Enterprise Virtualization Manager 3.1”

#### Summary

Upgrading Red Hat Enterprise Virtualization Manager to version 3.2 is performed using the **rhevm-upgrade** command. Virtualization hosts, and the virtual machines running upon them, will continue to operate independently while the Manager is being upgraded. Once the Manager upgrade is complete you will be able to upgrade your hosts, if you haven't already, to the latest versions of Red Hat Enterprise Linux and Red Hat Enterprise Virtualization Hypervisor.

**Important**

Users of Red Hat Enterprise Virtualization 3.0 must migrate to Red Hat Enterprise Virtualization 3.1 before attempting this upgrade.

**Note**

In the event that the upgrade fails the **rhevm-upgrade** command will attempt to roll your Red Hat Enterprise Virtualization Manager installation back to its previous state. Where this also fails detailed instructions for manually restoring the installation are displayed.

**Procedure 6.2. Upgrading to Red Hat Enterprise Virtualization Manager 3.2**

1. **Add Red Hat Enterprise Virtualization 3.2 Subscription**

   Ensure that the system is subscribed to the required channels and entitlements to receive Red Hat Enterprise Virtualization Manager 3.2 packages. This procedure assumes that the system is already subscribed to required channels and entitlements to receive Red Hat Enterprise Virtualization 3.1 packages. These must also be available to complete the upgrade process.

   ### Certificate-based Red Hat Network

   The Red Hat Enterprise Virtualization 3.2 packages are provided by the **rhel-6-server-rhevm-3.2-rpms** repository associated with the **Red Hat Enterprise Virtualization** entitlement. Use the **yum-config-manager** command to enable the repository in your **yum** configuration. The **yum-config-manager** command must be run while logged in as the **root** user.

   ```
   # yum-config-manager --enable rhel-6-server-rhevm-3.2-rpms
   ```

   ### Red Hat Network Classic

   The Red Hat Enterprise Virtualization 3.2 packages are provided by the **Red Hat Enterprise Virtualization Manager (v.3.2 x86_64)** channel, also referred to as **rhel-x86_64-server-6-rhevm-3.2** in Red Hat Network Classic.

   ```
   rhn-channel --add --channel=rhel-x86_64-server-6-rhevm-3.2
   ```

   Use the **rhn-channel** command, or the Red Hat Network Web Interface, to subscribe to the **Red Hat Enterprise Virtualization Manager (v.3.2 x86_64)** channel.

2. **Update the *rhevm-setup* Package**

   To ensure that you have the most recent version of the **rhevm-upgrade** command installed you must update the *rhevm-setup* package. Log in as the **root** user and use **yum** to update the *rhevm-setup* package.

   ```
   # yum update rhevm-setup
   ```

3. **Run the rhevm-upgrade Command**

   To upgrade Red Hat Enterprise Virtualization Manager run the **rhevm-upgrade** command. You must be logged in as the **root** user to run this command.

   ```
   # rhevm-upgrade
   Loaded plugins: product-id, rhnplugin
   Info: RHEV Manager 3.1 to 3.2 upgrade detected
   Checking pre-upgrade conditions...(This may take several minutes)
   ```

4. If the *ipa-server* package is installed then an error message is displayed. Red Hat Enterprise

Virtualization Manager 3.2 does not support installation on the same machine as Identity Management (IdM).

```
Error: IPA was found to be installed on this machine. Red Hat Enterprise
Virtualization Manager 3.2 does not support installing IPA on the same
machine. Please remove ipa packages before you continue.
```

To resolve this issue you must migrate the IdM configuration to another system before re-attempting the upgrade. For further information see https://access.redhat.com/knowledge/articles/233143.

### Result

Your Red Hat Enterprise Virtualization Manager installation has now been upgraded. To take full advantage of all Red Hat Enterprise Virtualization 3.2 features you must also:

- Ensure that all of your virtualization hosts are up to date and running the most recent Red Hat Enterprise Linux packages or Hypervisor images.
- Change all of your clusters to use compatibility version 3.2.
- Change all of your data centers to use compatibility version 3.2.

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## 6.3. Upgrading to Red Hat Enterprise Virtualization Manager 3.1

### Summary

Upgrading Red Hat Enterprise Virtualization Manager to version 3.1 is performed using the **`rhevm-upgrade`** command. Virtualization hosts, and the virtual machines running upon them, will continue to operate independently while the Manager is being upgraded. Once the Manager upgrade is complete you will be able to upgrade your hosts, if you haven't already, to the latest versions of Red Hat Enterprise Linux and Red Hat Enterprise Virtualization Hypervisor.

**Important**

Refer to https://access.redhat.com/knowledge/articles/269333 for an up to date list of tips and considerations to be taken into account when upgrading to Red Hat Enterprise Virtualization 3.1.

**Important**

Users of Red Hat Enterprise Virtualization 2.2 must migrate to Red Hat Enterprise Virtualization 3.0 before attempting this upgrade. For information on migrating from Red Hat Enterprise Virtualization 2.2 to Red Hat Enterprise Virtualization 3.0, refer to https://access.redhat.com/knowledge/techbriefs/migrating-red-hat-enterprise-virtualization-manager-version-22-30.

**Note**

In the event that the upgrade fails the **rhevm-upgrade** command will attempt to roll your Red Hat Enterprise Virtualization Manager installation back to its previous state. Where this also fails detailed instructions for manually restoring the installation are displayed.

**Procedure 6.3. Upgrading to Red Hat Enterprise Virtualization Manager 3.1**

1. **Add JBoss Enterprise Application Platform 6 Subscription**

   Ensure that the system is subscribed to the required channels and entitlements to receive JBoss Enterprise Application Platform 6 packages. JBoss Enterprise Application Platform 6 is a required dependency of Red Hat Enterprise Virtualization Manager 3.1.

   ### Certificate-based Red Hat Network

   The JBoss Enterprise Application Platform 6 packages are provided by the **JBoss Enterprise Application Platform** entitlement in certificate-based Red Hat Network.

   Use the **subscription-manager** command to ensure that the system is subscribed to the **JBoss Enterprise Application Platform** entitlement.

   ```
   # subscription-manager list
   ```

   ### Red Hat Network Classic

   The JBoss Enterprise Application Platform 6 packages are provided by the **JBoss Application Platform (v 6) for 6Server x86_64** channel, also referred to as **jbappplatform-6-x86_64-server-6-rpm**, in Red Hat Network Classic. The Channel Entitlement Name for this channel is **JBoss Enterprise Application Platform (v 4, zip format)**.

   Use the **rhn-channel** command, or the Red Hat Network Web Interface, to subscribe to the **JBoss Application Platform (v 6) for 6Server x86_64** channel.

2. **Add Red Hat Enterprise Virtualization 3.1 Subscription**

   Ensure that the system is subscribed to the required channels and entitlements to receive Red Hat Enterprise Virtualization Manager 3.1 packages.

   ### Certificate-based Red Hat Network

   The Red Hat Enterprise Virtualization 3.1 packages are provided by the **rhel-6-server-rhevm-3.1-rpms** repository associated with the **Red Hat Enterprise Virtualization** entitlement. Use the **yum-config-manager** command to enable the repository in your **yum** configuration. The **yum-config-manager** command must be run while logged in as the **root** user.

   ```
   # yum-config-manager --enable rhel-6-server-rhevm-3.1-rpms
   ```

   ### Red Hat Network Classic

   The Red Hat Enterprise Virtualization 3.1 packages are provided by the **Red Hat Enterprise Virtualization Manager (v.3.1 x86_64)** channel, also referred to as **rhel-x86_64-server-6-rhevm-3.1** in Red Hat Network Classic.

Use the **rhn-channel** command, or the Red Hat Network Web Interface, to subscribe to the **Red Hat Enterprise Virtualization Manager (v.3.1 x86_64)** channel.

3. **Remove Red Hat Enterprise Virtualization 3.0 Subscription**

   Ensure that the system does not use any Red Hat Enterprise Virtualization Manager 3.0 packages by removing the Red Hat Enterprise Manager 3.0 channels and entitlements.

   ### Certificate-based Red Hat Network

   Use the **yum-config-manager** command to disable the Red Hat Enterprise Virtualization 3.0 repositories in your **yum** configuration. The **yum-config-manager** command must be run while logged in as the **root** user.

   ```
   # yum-config-manager --disablerepo=rhel-6-server-rhevm-3-rpms
   ```

   ```
   # yum-config-manager --disablerepo=jb-eap-5-for-rhel-6-server-rpms
   ```

   ### Red Hat Network Classic

   Use the **rhn-channel** command, or the Red Hat Network Web Interface, to remove the **Red Hat Enterprise Virtualization Manager (v.3.0 x86_64)** channels.

   ```
   # rhn-channel --remove --channel=rhel-6-server-rhevm-3
   ```

   ```
   # rhn-channel --remove --channel=jbappplatform-5-x86_64-server-6-rpm
   ```

4. **Update the *rhevm-setup* Package**

   To ensure that you have the most recent version of the **rhevm-upgrade** command installed you must update the *rhevm-setup* package. Log in as the **root** user and use **yum** to update the *rhevm-setup* package.

   ```
   # yum update rhevm-setup
   ```

5. **Run the `rhevm-upgrade` Command**

   To upgrade Red Hat Enterprise Virtualization Manager run the **rhevm-upgrade** command. You must be logged in as the **root** user to run this command.

   ```
   # rhevm-upgrade
   Loaded plugins: product-id, rhnplugin
   Info: RHEV Manager 3.0 to 3.1 upgrade detected
   Checking pre-upgrade conditions...(This may take several minutes)
   ```

6. If the *ipa-server* package is installed then an error message is displayed. Red Hat Enterprise Virtualization Manager 3.1 does not support installation on the same machine as Identity Management (IdM).

   ```
   Error: IPA was found to be installed on this machine. Red Hat Enterprise
   Virtualization Manager 3.1 does not support installing IPA on the same
   machine. Please remove ipa packages before you continue.
   ```

   To resolve this issue you must migrate the IdM configuration to another system before re-attempting the upgrade. For further information see

https://access.redhat.com/knowledge/articles/233143.

7. A list of packages that depend on JBoss Enterprise Application Platform 5 is displayed. These packages must be removed to install JBoss Enterprise Application Platform 6, required by Red Hat Enterprise Virtualization Manager 3.1.

```
 Warning: the following packages will be removed if you proceed with the
upgrade:

    * objectweb-asm

 Would you like to proceed? (yes|no):
```

   You must enter **yes** to proceed with the upgrade, removing the listed packages.

### Result

Your Red Hat Enterprise Virtualization Manager installation has now been upgraded. To take full advantage of all Red Hat Enterprise Virtualization 3.1 features you must also:

- Ensure that all of your virtualization hosts are up to date and running the most recent Red Hat Enterprise Linux packages or Hypervisor images.
- Change all of your clusters to use compatibility version 3.1.
- Change all of your data centers to use compatibility version 3.1.

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## 6.4. Changing the Cluster Compatibility Version

**Prerequisites:**

- Section 5.4, “Updating Red Hat Enterprise Virtualization Hypervisors”
- Section 5.5, “Updating Red Hat Enterprise Linux Virtualization Hosts”

### Summary

Red Hat Enterprise Virtualization clusters have a compatibility version. The cluster compatibility version indicates the features of Red Hat Enterprise Virtualization supported by all of the hosts in the cluster. The cluster compatibilty is set according to the version of the least capable host operating system in the cluster.

**Note**

To change the cluster compatibility version, you must have first updated all the hosts in your cluster to a level that supports your desired compatibility level.

**Procedure 6.4. Changing the Cluster Compatibility Version**

1. Log in to the Administration Portal as the administrative user. By default this is the **admin** user.
2. Click the **Clusters** tab.
3. Select the cluster that you wish to change from the list displayed. If the list of clusters is too long to filter visually then perform a search to locate the desired cluster.
4. Click the **Edit** button.

5. Change the **Compatibility Version** to the desired value.
6. Click **OK**.

### Result

You have updated the compatibility version of the cluster. Once you have updated the compatibility version of all clusters in a data center, then you are also able to change the compatibility version of the data center itself.

Report a bug

## 6.5. Changing the Data Center Compatibility Version

**Prerequisites:**

- Section 6.4, “Changing the Cluster Compatibility Version”

### Summary

Red Hat Enterprise Virtualization data centers have a compatibility version. The compatibility version indicates the version of Red Hat Enterprise Virtualization that the data center is intended to be compatible with. All clusters in the data center must support the desired compatibility level.

**Procedure 6.5. Changing the Data Center Compatibility Version**

1. Log in to the Administration Portal as the administrative user. By default this is the **admin** user.
2. Click the **Data Centers** tab.
3. Select the data center that you wish to change from the list displayed. If the list of data centers is too long to filter visually then perform a search to locate the desired data center.
4. Click the **Edit** button.
5. Change the **Compatibility Version** to the desired value.
6. Click **OK**.

### Result

You have updated the compatibility version of the data center.

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# Part III. Installing Virtualization Hosts

# Chapter 7. Introduction to Virtualization Hosts

## 7.1. Workflow Progress — Installing Virtualization Hosts

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## 7.2. Introduction to Virtualization Hosts

Red Hat Enterprise Virtualization supports both virtualization hosts which run the Red Hat Enterprise Virtualization Hypervisor, and those which run Red Hat Enterprise Linux. Both types of virtualization host are able to coexist in the same Red Hat Enterprise Virtualization environment.

Prior to installing virtualization hosts you should ensure that:

- all virtualization hosts meet the hardware requirements, and
- you have successfully completed installation of the Red Hat Enterprise Virtualization Manager.

Additionally you may have chosen to install the Red Hat Enterprise Virtualization Manager Reports. This is not mandatory and is not required to commence installing virtualization hosts. Once you have completed the above tasks you are ready to install virtualization hosts.

**Important**

It is recommended that you install at least two virtualization hosts and attach them to the Red Hat Enterprise Virtualization environment. Where you attach only one virtualization host you will be unable to access features such as migration which require redundant hosts.

**Important**

The Red Hat Enterprise Virtualization Hypervisor is a closed system. Use a Red Hat Enterprise Linux host if additional rpms are required for your environment.

- Chapter 8, *Installing Red Hat Enterprise Virtualization Hypervisor Hosts*
- Chapter 9, *Installing Red Hat Enterprise Linux Hosts*

**See Also:**

- Section 2.2.3, “Virtualization Host Hardware Requirements”

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# Chapter 8. Installing Red Hat Enterprise Virtualization Hypervisor Hosts

## 8.1. Red Hat Enterprise Virtualization Hypervisor Installation Overview

Before commencing Hypervisor installation you must be aware that:

- The Red Hat Enterprise Virtualization Hypervisor *must* be installed on a physical server. It must not be installed in a Virtual Machine.
- The installation process will reconfigure the selected storage device and destroy all data. Therefore, ensure that any data to be retained is successfully backed up before proceeding.
- All Hypervisors in an environment must have unique hostnames and IP addresses, in order to avoid network conflicts.
- Instructions for using Network (PXE) Boot to install the Hypervisor are contained in the *Red Hat Enterprise Linux — Hypervisor Deployment Guide*, available at http://www.redhat.com/docs/.
- Red Hat Enterprise Virtualization Hypervisors can use Storage Attached Networks (SANs) and other network storage for storing virtualized guest images. However, a local storage device is required for installing and booting the Hypervisor.

**Note**

Red Hat Enterprise Virtualization Hypervisor installations can be automated or conducted without interaction. This type of installation is only recommended for advanced users. Refer to the *Red Hat Enterprise Virtualization — Hypervisor Deployment Guide* for more information.

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## 8.2. Installing the Red Hat Enterprise Virtualization Hypervisor Packages

### Summary

The **`Red Hat Enterprise Virtualization Hypervisor (v.6 x86_64)`** Red Hat Network channel contains the Hypervisor packages. The Hypervisor itself is contained in the *rhev-hypervisor* package. Additional tools supporting USB and PXE installations are also installed as a dependency. You must install the Hypervisor packages on the system that you intend to use to create Hypervisor boot media.

**Procedure 8.1. Installing the Red Hat Enterprise Virtualization Hypervisor Packages**

1. A. **Subscribing to download the Hypervisor using certificate-based RHN**
   a. **Identify Available Entitlement Pools**

      To subscribe the system to the Red Hat Enterprise Virtualization you must locate the identifier for the relevant entitlement pool. Use the ***`list`*** action of the **`subscription-manager`** to find these:

      To identify available subscription pools for **`Red Hat Enterprise Virtualization`** use the command:

```
# subscription-manager list --available | grep -A8 "Red Hat
Enterprise Virtualization"
```

b. **Subscribe System to Entitlement Pools**

Using the pool identifiers located in the previous step, subscribe the system to **Red Hat Enterprise Linux Server**, **Red Hat Enterprise Virtualization** entitlements. Use the ***subscribe*** parameter to the **subscription-manager** command, replacing ***POOLID*** with one of the pool identifiers.:

```
# subscription-manager subscribe --pool=POOLID
```

B. **Subscribing to download the Hypervisor using RHN Classic**

a. Log on to Red Hat Network (http://rhn.redhat.com).

b. Move the mouse cursor over the **Subscriptions** link at the top of the page, and then click **Registered Systems** in the menu that appears.

c. Select the system to which you are adding channels from the list presented on the screen, by clicking the name of the system.

d. Click **Alter Channel Subscriptions** in the **Subscribed Channels** section of the screen.

e. Select the **Red Hat Enterprise Virtualization Manager Beta (v.3.2 x86_64)** channel from the list presented on the screen, then click the **Change Subscription** button to finalize the change.

2. Log in to the system on which the Red Hat Enterprise Virtualization Manager is installed. You must log in as the **root** user.

3. Use **yum** to install the *rhev-hypervisor*.

```
# yum install rhev-hypervisor
```

4. Use **yum** to install the *livecd-tools*.

```
# yum install livecd-tools
```

### Result

The Hypervisor ISO image is installed into the **/usr/share/rhev-hypervisor/** directory. The **livecd-iso-to-disk** and **livecd-iso-to-pxeboot** scripts are installed to the **/usr/bin** directory.

**Note**

Red Hat Enterprise Linux 6.2 and later allows more than one version of the ISO image to be installed at one time. As such, **/usr/share/rhev-hypervisor/rhev-hypervisor.iso** is now a symbolic link to a uniquely-named version of the Hypervisor ISO image, such as **/usr/share/rhev-hypervisor/rhev-hypervisor-6.4-20130321.0.el6ev.iso**. Different versions of the image can now be installed alongside each other, allowing administrators to run and maintain a cluster on a previous version of the Hypervisor while upgrading another cluster for testing.
Additionally, the symbolic link **/usr/share/rhev-hypervisor/rhevh-latest-6.iso**, is created. This links also targets the most recently installed version of the Red Hat Enterprise Virtualization ISO image.

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## 8.3. Preparing Hypervisor Installation Media

### 8.3.1. Preparing USB Hypervisor Installation Media

#### 8.3.1.1. Preparing a Hypervisor USB Storage Device

Red Hat Enterprise Virtualization Hypervisor is able to install itself onto USB storage devices or solid state disks. However, the initial boot/install USB device must be a separate device from the installation target. Network booting with PXE and tftp provides the greatest flexibility and scalability. For environments where network restrictions prevent network booting, or for systems without PXE capable network interface cards, a local media installation such as CD-ROM or USB is necessary. Booting from USB storage devices is a useful alternative to booting from CD, for systems without CD-ROM drives.

**Note**

Not all systems support booting from a USB storage device. Ensure that your system's BIOS supports booting from USB storage devices before proceeding.

**See Also:**

- Section 8.3.1.2, “Preparing USB Installation Media using livecd-iso-to-disk”
- Section 8.3.1.3, “Preparing USB Installation Media Using dd”

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#### 8.3.1.2. Preparing USB Installation Media using livecd-iso-to-disk

**Summary**

The **livecd-iso-to-disk** command will install a Hypervisor onto a USB storage device. The **livecd-iso-to-disk** command is included in the *rhev-hypervisor-tools* package. Devices which have the Hypervisor image written to them with this command are able to boot the Hypervisor on systems which support booting via USB.

The basic **livecd-iso-to-disk** command usage follows this structure:

```
# livecd-iso-to-disk image device
```

Where the ***device*** parameter is the partition name of the USB storage device to install to. The ***image*** parameter is a ISO image of the Hypervisor. The default hypervisor image location is **/usr/share/rhev-hypervisor/rhev-hypervisor.iso**. The **livecd-iso-to-disk** command requires devices to be formatted with the **FAT** or **EXT3** file system.

**Note**

**livecd-iso-to-disk** uses a **FAT** or **EXT3** formatted partition or block device.
USB storage devices are sometimes formatted without a partition table, use **/dev/sdb** or similar device name.
When a USB storage device is formatted with a partition table, use **/dev/sdb1** or similar device name.

**Procedure 8.2. Preparing USB Installation Media using livecd-iso-to-disk**

1. Install the *rhev-hypervisor* package.
2. Use the **livecd-iso-to-disk** command to copy the image file, located in the **/usr/share/rhev-hypervisor/** directory, to the disk. The ***--format*** parameter formats the USB device. The ***--reset-mbr*** initializes the Master Boot Record (MBR).

   **Example 8.1. Use of livecd-iso-to-disk**

   This example demonstrates the use of **livecd-iso-to-disk** to write to a USB storage device named **/dev/sdc**.

```
# livecd-iso-to-disk --format --reset-mbr /usr/share/rhev-hypervisor/rhev-
hypervisor.iso /dev/sdc
Verifying image...
/usr/share/rhev-hypervisor/rhev-hypervisor.iso:
eccc12a0530b9f22e5ba62b848922309
Fragment sums:
8688f5473e9c176a73f7a37499358557e6c397c9ce2dafb5eca5498fb586
Fragment count: 20
Checking: 100.0%

The media check is complete, the result is: PASS.

It is OK to use this media.
Copying live image to USB stick
Updating boot config file
Installing boot loader
syslinux: only 512-byte sectors are supported
USB stick set up as live image!
```

**Important**

Red Hat Enterprise Linux 6.3 enables the use of the Unified Extensible Firmware Interface (UEFI) as a Technology Preview.
Technology Preview features provide early access to upcoming product features, allowing you to test functionality and provide feedback during feature development. However, these features are not fully supported, may not be functionally complete, and are not intended for production use. Because these features are still under development, Red Hat cannot guarantee their stability. Therefore, you may not be able to upgrade seamlessly from a Technology Preview feature to a subsequent release of that feature. Additionally, if the feature does not meet standards for enterprise viability, Red Hat cannot guarantee that the Technology Preview will be released in a supported manner. Some Technology Preview features may only be available for specific hardware architectures.
Using UEFI requires an additional parameter, ***--efi***, with the **livecd-iso-to-disk** command in order to correctly set up and enable UEFI. The ***--efi*** parameter is used like so:

```
# livecd-iso-to-disk --format -- efi image device
```

```
# livecd-iso-to-disk --format /usr/share/rhev-hypervisor/rhev-
hypervisor.iso /dev/sdc
```

Note that this Technology Preview is only available in Red Hat Enterprise Linux 6.3.

### Result

The USB storage device has been prepared. You can now use it to boot a system and install the Hypervisor.

Report a bug

### 8.3.1.3. Preparing USB Installation Media Using dd

The **dd** command can also be used to install a hypervisor onto a USB storage device. Media created with the command can boot the Hypervisor on systems which support booting via USB. Red Hat Enterprise Linux provides **dd** as part of the *coreutils* package. Versions of **dd** are also available on a wide variety of Linux and Unix operating systems.

Windows users are able to obtain the **dd** command through installation of **Red Hat Cygwin**, a free Linux-like environment for Windows.

The basic **dd** command usage follows this structure:

```
# dd if=image of=device
```

Where the ***device*** parameter is the device name of the USB storage device to install to. The ***image*** parameter is a ISO image of the Hypervisor. The default hypervisor image location is **/usr/share/rhev-hypervisor/rhev-hypervisor.iso**. The **dd** command does not make assumptions as to the format of the device as it performs a low-level copy of the raw data in the selected image.

**See Also:**

- Section 8.3.1.4, “Preparing USB Installation Media using dd on Linux Systems”
- Section 8.3.1.5, “Preparing USB Installation Media using dd on Windows Systems”

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### 8.3.1.4. Preparing USB Installation Media using dd on Linux Systems

#### Summary

The **dd** command available on most Linux systems is suitable for creating USB installation media, to boot and install the Hypervisor.

**Procedure 8.3. Preparing USB Installation Media using dd on Linux Systems**

1. Install the *rhev-hypervisor* package.

```
# yum install rhev-hypervisor
```

2. Use the **dd** command to copy the image file to the disk.

**Example 8.2. Use of dd**

This example uses a USB storage device named **/dev/sdc**.

```
# dd if=/usr/share/rhev-hypervisor/rhev-hypervisor.iso of=/dev/sdc
243712+0 records in
243712+0 records out
124780544 bytes (125 MB) copied, 56.3009 s, 2.2 MB/s
```

**Warning**

The **dd** command will overwrite all data on the device specified for the ***of*** parameter. Any existing data on the device will be destroyed. Ensure that the correct device is specified and that it contains no valuable data before invocation of the **dd** command.

#### Result

The USB storage device is ready for use as Hypervisor installation media.

Report a bug

### 8.3.1.5. Preparing USB Installation Media using dd on Windows Systems

#### Summary

The **dd** command, available on Windows systems with Red Hat Cygwin installed, is suitable for creating USB installation media to boot and install the Hypervisor.

**Procedure 8.4. Preparing USB Installation Media using dd on Windows Systems**

1. Access http://www.redhat.com/services/custom/cygwin/ and click the **Red Hat Cygwin official installation utility** link. The **rhsetup.exe** executable will download.
2. As the **Administrator** user run the downloaded **rhsetup.exe** executable. The **Red Hat Cygwin** installer will display.

3. Follow the prompts to complete a standard installation of **Red Hat Cygwin**. The *Coreutils* package within the *Base* package group provides the **dd** utility. This is automatically selected for installation.
4. Copy the **rhev-hypervisor.iso** file downloaded from **Red Hat Network** to **C:\rhev-hypervisor.iso**.
5. As the **Administrator** user run **Red Hat Cygwin** from the desktop. A terminal window will appear.

**Important**

On the **Windows 7** and **Windows Server 2008** platforms it is necessary to right click the **Red Hat Cygwin** icon and select the **Run as Administrator...** option to ensure the application runs with the correct permissions.

6. In the terminal run **cat /proc/partitions** to see the drives and partitions currently visible to the system.

**Example 8.3. View of Disk Partitions Attached to System**

```
Administrator@test /
$ cat /proc/partitions
major minor  #blocks  name
    8     0  15728640 sda
    8     1    102400 sda1
    8     2  15624192 sda2
```

7. Plug the USB storage device which is to be used as the media for the Hypervisor installation into the system. Re-run the **cat /proc/partitions** command and compare the output to that of the previous run. A new entry will appear which designates the USB storage device.

**Example 8.4. View of Disk Partitions Attached to System**

```
Administrator@test /
$ cat /proc/partitions
major minor  #blocks  name
    8     0  15728640 sda
    8     1    102400 sda1
    8     2  15624192 sda2
    8    16    524288 sdb
```

8. Use the **dd** command to copy the **rhev-hypervisor.iso** file to the disk. The example uses a USB storage device named **/dev/*sdb***. Replace ***sdb*** with the correct device name for the USB storage device to be used.

**Example 8.5. Use of dd Command Under Red Hat Cygwin**

```
Administrator@test /
$ dd if=/cygdrive/c/rhev-hypervisor.iso of=/dev/sdb& pid=$!
```

The provided command starts the transfer in the background and saves the process identifier so that it can be used to monitor the progress of the transfer. Refer to the next step for the command used to check the progress of the transfer.

**Warning**

The **dd** command will overwrite all data on the device specified for the ***of*** parameter. Any existing data on the device will be destroyed. Ensure that the correct device is specified and that it contains no valuable data before invocation of the **dd** command.

9. Transfer of the ISO file to the USB storage device with the version of **dd** included with **Red Hat Cygwin** can take significantly longer than the equivalent on other platforms.

   To check the progress of the transfer in the same terminal window that the process was started in send it the **USR1** signal. This can be achieved by issuing the **kill** command in the terminal window as follows:

```
kill -USR1 $pid
```

10. When the transfer operation completes the final record counts will be displayed.

**Example 8.6. Result of dd Initiated Copy**

```
210944+0 records in
210944+0 records out
108003328 bytes (108 MB) copied, 2035.82 s, 53.1 kB/s

[1]+    Done            dd if=/cygdrive/c/rhev-hypervisor.iso of=/dev/sdb
```

### Result

The USB storage device is ready for use as Hypervisor installation media.

Report a bug

## 8.3.2. Preparing Optical Hypervisor Installation Media

### Summary

Burn the Hypervisor image to a CD-ROM with the **wodim** command. The **wodim** command is part of the *wodim* package.

**Procedure 8.5. Preparing Optical Hypervisor Installation Media**

1. Verify that the *wodim* package is installed on the system.

**Example 8.7. Verify Installation of *wodim* Package**

```
# rpm -q wodim
wodim-1.1.9-11.el6.x86_64
```

If the package version is in the output the package is available.

If nothing is listed, install *wodim*:

```
# yum install wodim
```

2. Insert a blank CD-ROM or DVD into your CD or DVD writer.
3. Record the ISO file to the disc. The *wodim* command uses the following:

```
wodim dev=device image
```

This example uses the first CD-RW (**/dev/cdrw**) device available and the default hypervisor image location, **/usr/share/rhev-hypervisor/rhev-hypervisor.iso**.

**Example 8.8. Use of `wodim` Command**

```
# wodim dev=/dev/cdrw /usr/share/rhev-hypervisor/rhev-hypervisor.iso
```

#### Result

If no errors occurred, the Hypervisor is ready to boot. Errors sometimes occur during the recording process due to errors on the media itself. If this occurs insert another writable disk and repeat the command above.

The Hypervisor uses a program (**isomd5sum**) to verify the integrity of the installation media every time the Hypervisor is booted. If media errors are reported in the boot sequence you have a bad CD-ROM. Follow the procedure above to create a new CD-ROM or DVD.

Report a bug

## 8.3.3. Booting from Hypervisor Installation Media

### 8.3.3.1. Booting the Hypervisor from USB Installation Media

#### Summary

Booting a hypervisor from a USB storage device is similar to booting other live USB operating systems. Follow this procedure to boot the Hypervisor using USB installation media.

**Procedure 8.6. Booting the Hypervisor from USB Installation Media**

1. Enter the system's BIOS menu to enable USB storage device booting if not already enabled.
    a. Enable USB booting if this feature is disabled.
    b. Set booting USB storage devices to be first boot device.
    c. Shut down the system.
2. Insert the USB storage device that contains the Hypervisor boot image.
3. Restart the system.

#### Result

The Hypervisor boot process commences automatically.

**See Also:**

- Section 8.3.3.3, “Troubleshooting BIOS Settings and Boot Process”
- Section 8.3.3.4, “Choosing Hypervisor Boot Options”

Report a bug

### 8.3.3.2. Booting the Hypervisor from Optical Installation Media

#### Summary

Booting the Hypervisor from optical installation media requires the system to have a correctly defined BIOS boot configuration.

**Procedure 8.7. Booting the Hypervisor from Optical Installation Media**

1. Ensure that the system's BIOS is configured to boot from the CD-ROM or DVD-ROM drive first. For many systems this the default.

**Note**

Refer to your manufacturer's manuals for further information on modifying the system's BIOS boot configuration.

2. Insert the Hypervisor CD-ROM in the CD-ROM or DVD-ROM drive.
3. Reboot the system.

#### Result

The Hypervisor boot screen will be displayed.

**See Also:**

- Section 8.3.3.3, “Troubleshooting BIOS Settings and Boot Process”
- Section 8.3.3.4, “Choosing Hypervisor Boot Options”

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### 8.3.3.3. Troubleshooting BIOS Settings and Boot Process

#### Summary

Before installing Red Hat Enterprise Virtualization Hypervisors it is necessary to verify the BIOS is correctly configured for the chosen installation method. Many motherboard and PC manufacturers disable different booting methods in the BIOS. Most BIOS chips boot from the following devices in order:

1. 3.5 inch diskette
2. CD-ROM or DVD device
3. Local hard disk

Many BIOS chips have disabled one or more of the following boot methods: USB storage devices, CD-ROMs, DVDs or network boot. To boot from your chosen method, enable the method or device and set that device as the first boot device in BIOS.

Most but not all motherboards support the boot methods described in this chapter. Consult the documentation for your motherboard or system to determine whether it is possible to use a particular boot method.

**Warning**

BIOS settings vary between manufacturers. Any specific examples of BIOS settings may be inaccurate for some systems. Due to this inconsistency, it is necessary to review the motherboard or system manufacturer's documentation.

**Procedure 8.8. Troubleshooting BIOS Settings and Boot Process**

Verify that your system is capable of running the Red Hat Enterprise Virtualization Hypervisor. Hypervisors require that virtualization extensions are present and enabled in the BIOS before installation proceeds.

1. Boot the Hypervisor from removable media. For example, a USB stick or CD-ROM.
2. When the message **`Automatic boot in 30 seconds...`** is displayed, and begins counting down from thirty, press any key to skip the automatic boot process.
3. Ensure the **`Install or Upgrade`** option is selected and press **`Tab`** to edit the boot parameters.
4. Add the **`rescue`** parameter to the list of boot parameters shown on the screen, then press **`Enter`**. This action will boot the Hypervisor in rescue mode.
5. Once the Hypervisor boots, verify your CPU contains the virtualization extensions with the following command:

   ```
   # grep -E "svm|vmx" /proc/cpuinfo
   ```

   Output displays if the processor has the hardware virtualization extensions.
6. Verify that the KVM modules load by default:

   ```
   # lsmod | grep kvm
   ```

**Result**

If the output includes **`kvm_intel`** or **`kvm_amd`** then the kvm hardware virtualization modules are loaded and the system meets the requirements. If the output does not include the required modules then you must check that your hardware supports the virtualization extensions and that they are enabled in the system's BIOS.

Report a bug

### 8.3.3.4. Choosing Hypervisor Boot Options

**Summary**

The Hypervisor boot menu presents a number of pre-configured boot modes, as well as the ability to add and remove additional boot options.

**Procedure 8.9. Choosing Hypervisor Boot Options**

1. Insert the Red Hat Enterprise Virtualization Hypervisor installation media.
2. Power on the system and ensure the system boots from the installation media.
3. The boot splash screen appears. If no input is provided, the Hypervisor installation will commence in 30 seconds, using default kernel parameters.

**Figure 8.1. Boot Splash Screen**

4. To modify the boot options, press any key. The boot menu will display.

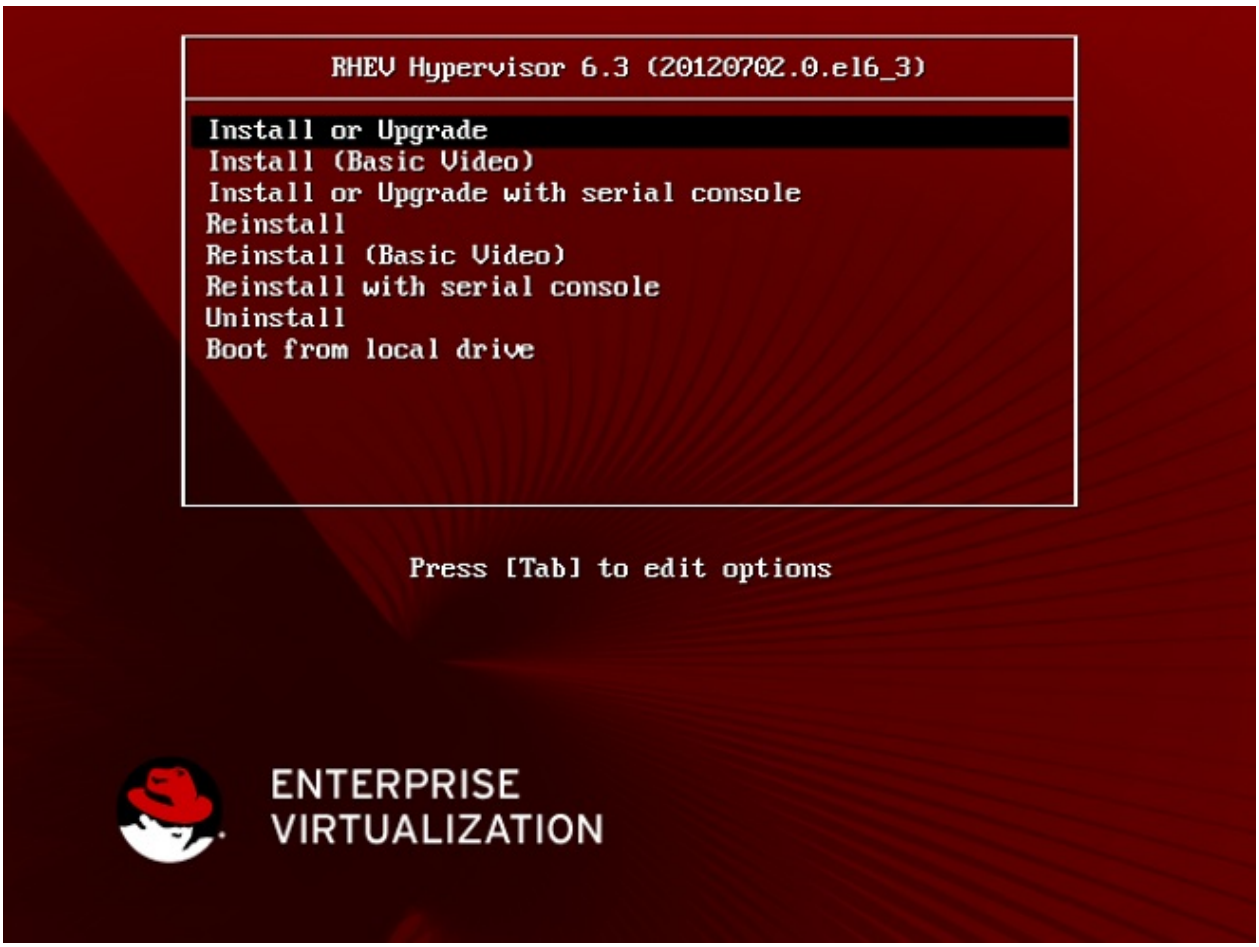


**Figure 8.2. Boot Menu Screen**

The following boot options are available:

**Install or Upgrade**
Boot the Hypervisor installer.

**Install (Basic Video)**
Install or Upgrade the Hypervisor, using basic video mode.

**Install or Upgrade with Serial Console**
Install or Upgrade the Hypervisor, with the console redirected to a serial device attached to **/dev/ttyS0**.

**Reinstall**
Reinstall the Hypervisor.

**Reinstall (Basic Video)**
Reinstall the Hypervisor, using basic video mode.

**Reinstall with Serial Console**
Reinstall the Hypervisor, with the console redirected to a serial device attached to **/dev/ttyS0**.

**Boot from Local Drive**
Boot the operating system installed on the first local drive.

Select the appropriate boot option from the boot menu.

5. A. Press the **Enter** key to boot the Hypervisor with the default kernel parameters for the option selected; or

   B. press the **Tab** key to edit the kernel parameters. In edit mode you are able to add or remove kernel parameters. Kernel parameters must be separated from each other by a space. Once the desired kernel parameters have been set press **Enter** to boot the system. Alternatively pressing **Esc** reverts any changes that you have made to the kernel parameters.

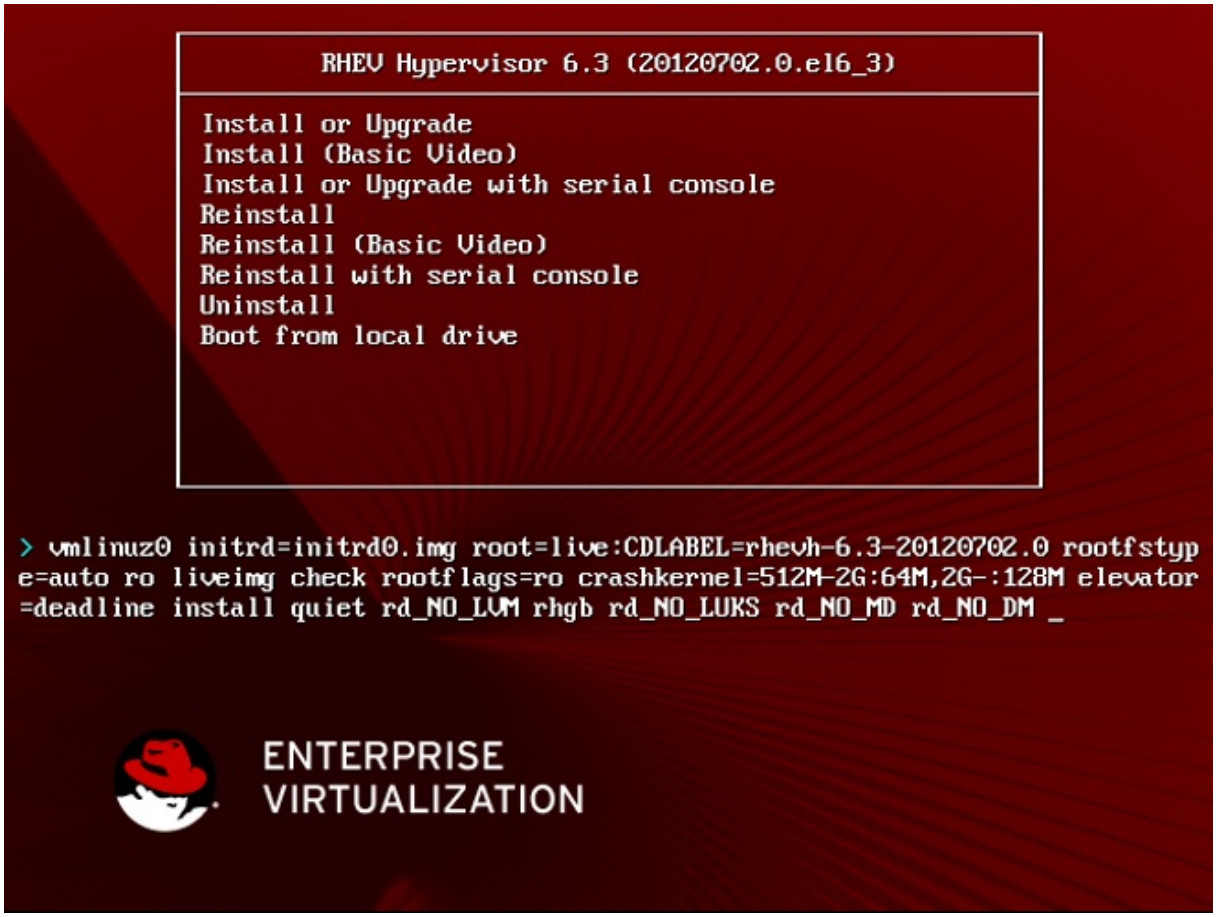


**Figure 8.3. Boot Parameter Screen**

For a list of supported kernel parameters, see the *Red Hat Enterprise Linux — Hypervisor Deployment Guide*.

### Result

The Hypervisor boots with the provided boot options.

Report a bug

## 8.4. Installing the Hypervisor

### 8.4.1. Hypervisor Menu Actions

- The directional keys (**Up**, **Down**, **Left**, **Right**) are used to select different controls on the screen. Alternatively the **Tab** key cycles through the controls on the screen which are enabled.

- Text fields are represented by a series of underscores (_). To enter data in a text field select it and begin entering data.
- Buttons are represented by labels which are enclosed within a pair of angle brackets (**<** and **>**). To activate a button ensure it is selected and press **Enter** or **Space**.
- Boolean options are represented by an asterisk (*****) or a space character enclosed within a pair of square brackets (**[** and **]**). When the value contained within the brackets is an asterisk then the option is set, otherwise it is not. To toggle a Boolean option on or off press **Space** while it is selected.

Report a bug

## 8.4.2. Installing the Hypervisor Interactively

### Summary

Red Hat Enterprise Virtualization Hypervisors are able to use Storage Area Networks (SANs) and other network storage for storing virtualized guest images. Hypervisors can be installed on SANs, provided that the Host Bus Adapter (HBA) permits configuration as a boot device in BIOS.

Hypervisors are able to use multipath devices for installation. Multipath is often used for SANs or other networked storage. Multipath is enabled by default at install time. Any block device which responds to **scsi_id** functions with multipath. Devices where this is not the case include USB storage and some older ATA disks.

There are two methods for installing Red Hat Enterprise Virtualization Hypervisors:

- Interactive Installation, documented here; and .
- Unattended installation.

For information about unattended installation, refer to the *Red Hat Enterprise Linux — Hypervisor Deployment Guide*.

**Procedure 8.10. Installing the Hypervisor Interactively**

1. To commence Hypervisor installation select **Install Hypervisor** and press **Enter**.
2. **Keyboard Selection**

   The Keyboard screen allows you to configure the appropriate keyboard layout for your locale. Use the arrow keys to highlight the appropriate option. To save your selection, use **Tab** to move to **Apply**, and press **Enter**.

**Example 8.9. Keyboard Layout Configuration**

```
Keyboard Layout Selection

| Swiss German (latin1)                |
| Slovak (qwerty)                       |
| Slovenian                             |
| Serbian                               |
| Serbian (latin)                      |
| Swedish                               |
| Turkish                               |
| Ukrainian                             |
| United Kingdom                        |
| *** U.S. English ******************** |

<Apply>   <Reset>
```

3. **Disk Configuration**

   The installation script automatically detects all disks attached to the system. This information is used to assist with selection of the boot and installation disks that the Hypervisor should use. Each entry displayed on these screens indicates the **`Location`**, **`Device Name`**, and **`Size (GB)`** of the relevant disk.

   a. **Boot disk**

   The first disk selection screen is used to select the disk from which the Hypervisor will boot. The Hypervisor's boot loader will be installed to the Master Boot Record (MBR) of the disk that is selected on this screen. The Hypervisor attempts to automatically detect the disks attached to the system and presents the list from which you choose the boot device. Alternatively you are able to manually select a device, by specifying a block device name, by enabling the **`Other Device`** option.

**Important**

The disk selected must be identified as a boot device and appear in the boot order either in the system's BIOS or in a pre-existing boot loader.

   A. **Automatically Detected Device Selection**

      a. Select the entry for the disk the Hypervisor is to boot from in the list.

      b. Select the **`<Continue>`** button and press **`Enter`**. This action will save the boot device selection and start the next step of installation.

   B. **Manual Device Selection**

      a. Select the **`Other Device`** entry from the list.

      b. Select the **`<Continue>`** button and press **`Enter`**.

      c. When prompted to **`Please enter the disk to use for booting RHEV Hypervisor`** enter the name of the block device from which the Hypervisor should boot.

**Example 8.10. Other Device Selection**

```
Please enter the disk to use for booting RHEV Hypervisor
/dev/sda
```

d. Select the **<Continue>** button and press **Enter**. This action will save the boot device selection and start the next step of installation.

Once a disk has been selected it is necessary to select the **<Continue>** button and press **Enter** to save the selection and continue with hypervisor installation.

b. **Installation Disk(s)**

The disk(s) selected for installation will be those to which the Hypervisor itself is installed. The Hypervisor attempts to automatically detect the disks attached to the system and presents the list from which installation devices are chosen.

**Warning**

All data on the selected storage device(s) will be destroyed.

a. Select each disk which the Hypervisor is to use for installation and press **Space** to toggle it to enabled. Repeat this step for all disks you want the Hypervisor to use. Where other devices are to be used for installation, either solely or in addition to those which are listed automatically, enable the **Other Device** option.

b. Select the **<Continue>** button and press **Enter** to continue.

c. Where the **Other Device** option was specified a further prompt will appear. Enter the name of each additional block device to use for hypervisor installation separated by a comma. Once all required disks have been selected then select the **<Continue>** button and press **Enter**.

**Example 8.11. Other Device Selection**

```
Please select the disk(s) to use for installation of RHEV
Hypervisor
Enter multiple entries separated by commas
/dev/mmcblk0,/dev/mmcblk1_______________
```

Once the installation disk, or disks, have been selected the next stage of the installation starts.

4. **Password**

The Hypervisor requires that a password be set to protect local console access by the **admin** user. The installation script prompts you to enter the desired password in both the **Password** and **Confirm Password** fields.

A strong password must be used. Strong passwords consist of a mix of uppercase, lowercase, numeric, and punctuation characters. They are six or more characters long and do not contain dictionary words.

Once a strong password has been entered select **<Install>** and press **Enter** to install the Hypervisor to disk.

### Result

Once installation is complete the message **RHEV Hypervisor Installation Finished Successfully** will be displayed. Select the **<Restart>** button and press **Enter** to reboot the system.

**Note**

The boot media should be removed and the boot device order changed to prevent the installation sequence restarting after the system reboots.

Report a bug

## 8.5. Configuring the Hypervisor

### 8.5.1. Logging into the Hypervisor

#### Summary

The Hypervisor allows local console logins to facilitate post-installation configuration.

**Procedure 8.11. Logging into the Hypervisor**

1. Boot the Hypervisor. The login prompt will appear:

```
Please login as 'admin' to configure the node
localhost login:
```

2. Enter the username **admin** in the **login** field, then press **Enter**.
3. Enter the password that you set during Hypervisor installation, then press **Enter**.

#### Result

You have successfully logged into the Hypervisor as the **admin** user.

Report a bug

### 8.5.2. Selecting Hypervisor Keyboard

#### Summary

The **Keyboard** screen allows you to configure the appropriate keyboard layout for your locale.

```
Keyboard Layout Selection

| Swiss German (latin1)                |
| Slovak (qwerty)                       |
| Slovenian                             |
| Serbian                               |
| Serbian (latin)                      |
| Swedish                               |
| Turkish                              |
| Ukrainian                            |
| United Kingdom                        |
| *** U.S. English ******************** |

  <Apply>   <Reset>
```

**Procedure 8.12. Selecting Hypervisor Keyboard**

1. Select a **Keyboard Layout Configuration** from the list provided.
2. Select **Apply** and press **Enter** to save the selection.

**Result**

You have successfully configured the keyboard layout.

Report a bug

## 8.5.3. Viewing Hypervisor Status

The status screen displays a brief overview of the current state of the Hypervisor. The information displayed consists of:

- the hostname,
- the current status of the network connection,
- the destination(s) of logs and reports, and
- the number of active virtual machines.

The status screen also provides a number of buttons to change the state of the Hypervisor. They are:

- **<Lock>**: Locks the Hypervisor. The username and password must be entered to unlock the Hypervisor.
- **<Restart>**: Restarts the Hypervisor.
- **<Power Off>**: Turns the Hypervisor off.

Report a bug

## 8.5.4. Configuring Hypervisor Network

### 8.5.4.1. Hypervisor Network Screen

The **Network** screen is used to configure:

- the Hypervisor's hostname,
- the DNS server(s) to use,
- the NTP server(s) to use, and
- the network interface to use.

**See Also:**

- Section 8.5.4.2, “Configuring Hypervisor Hostname”
- Section 8.5.4.3, “Configuring Hypervisor Domain Name Services (DNS)”
- Section 8.5.4.4, “Configuring Hypervisor Network Time Protocol (NTP)”
- Section 8.5.4.5, “Configuring Hypervisor Network Interfaces”

Report a bug

### 8.5.4.2. Configuring Hypervisor Hostname

**Summary**

The Hypervisor hostname is configurable.

**Procedure 8.13. Configuring Hypervisor Hostname**

1. To set or change the hostname select the **Hostname** field on the **Network** screen, and enter the new hostname.
2. Select **<Apply>**, and press **Enter** to save changes to the hostname.

**Result**

The hostname has been updated.

Report a bug

#### 8.5.4.3. Configuring Hypervisor Domain Name Services (DNS)

**Summary**

The Hypervisor supports the specification of one or more Domain Name Services (DNS) servers. These servers will be used when resolving host and domain names.

**Procedure 8.14. Configuring Hypervisor Domain Name Services (DNS)**

1. To set or change the primary DNS server select the **DNS Server 1** field and enter the IP address of the new primary DNS server to use.
2. To set or change the secondary DNS server select the **DNS Server 2** field and enter the IP address of the new secondary DNS server to use.
3. Select **<Apply>**, and press **Enter** to save changes to the DNS configuration.

**Result**

The primary and secondary DNS servers queried by the Hypervisor are updated.

Report a bug

#### 8.5.4.4. Configuring Hypervisor Network Time Protocol (NTP)

**Summary**

The Hypervisor supports the specification of one or more Network Time Protocol (NTP) servers with which the Hypervisor should synchronize the system clock. It is important that the Hypervisor is synchronized with the same time source as the Red Hat Enterprise Virtualization Manager. This ensures accurate time keeping across the Red Hat Enterprise Virtualization environment.

**Procedure 8.15. Configuring Hypervisor Network Time Protocol (NTP)**

1. To set or change the primary NTP server select the **NTP Server 1** field and enter the IP address or hostname of the new primary NTP server to use.
2. To set or change the secondary NTP server select the **NTP Server 2** field and enter the IP address or hostname of the new secondary NTP server to use.
3. Select **<Apply>**, and press **Enter** to save changes to the NTP configuration.

**Result**

The primary and secondary NTP servers queried by the Hypervisor are updated.

Report a bug

### 8.5.4.5. Configuring Hypervisor Network Interfaces

#### Summary

For each network interface detected the Hypervisor will display the:

- **Device**,
- **Status**,
- **Model**, and
- **MAC Address**.

At least one network interface must be configured before the Hypervisor is able to connect with the Red Hat Enterprise Virtualization Manager.

**Procedure 8.16. Configuring Hypervisor Network Interfaces**

1. **Device Identification**

   Select the network interface to be configured from the list and press **Enter**.

   In some cases it may be unclear which physical device an entry in the list refers to. Where this is the case the Hypervisor is able to blink the physical device's network traffic lights to assist with identification. To make use of this facility select the entry from the list and, then select the **<Flash Lights to Identify>** button. Press **Enter** and, take note of which physical device's lights start blinking. The configuration screen for the selected device will be displayed.
2. **IPv4 Settings**

   The Hypervisor supports both dynamic (DHCP), and static IPv4 network configuration.

   A. **Dynamic (DHCP) Network Configuration**

   Dynamic network configuration allows the Hypervisor to be dynamically assigned an IP address via **DHCP**. To enable dynamic IPv4 network configuration select the **DHCP** option under **IPv4 Settings** and press **Space** to toggle it to enabled.

   B. **Static Network Configuration**

   Static network configuration allows the Hypervisor to be manually assigned an IP address. To enable static IPv4 network configuration select the **Static** option under **IPv4 Settings** and press **Space** to toggle it to enabled.

   Selection of the **Static** option enables the **IP Address**, **Netmask**, and **Gateway** fields. The **IP Address**, **Netmask**, and **Gateway** fields must be populated to complete static network configuration.

   In particular it is necessary that:

   - the **IP Address** is not already in use on the network,
   - the **Netmask** matches that used by other machines on the network, and
   - the **Gateway** matches that used by other machines on the network.

   Where it is not clear what value should be used for the **IP Address**, **Netmask**, or **Gateway** field consult the network's administrator or consider a dynamic configuration.

   **Example 8.12. Static IPv4 Networking Configuration**

```
IPv4 Settings
[ ] Disabled [ ] DHCP [*] Static
IP Address: 192.168.122.100_ Netmask: 255.255.255.0___
Gateway     192.168.1.1_____
```

3. **IPv6 Settings**

   The Red Hat Enterprise Virtualization Manager does not currently support IPv6 networking. IPv6 networking must remain set to **Disabled**.

4. **VLAN Configuration**

   If VLAN support is required then populate the **VLAN ID** field with the VLAN identifier for the selected device.

5. **Save Network Configuration**

   Once all networking options for the selected device have been set the configuration must be saved.

   a. Select the **<Apply>** button and press **Enter** to save the network configuration.

   b. The **Confirm Network Settings** dialog box will appear. Ensure that the **Ok** button is selected and press **Enter** to confirm.

#### Result

The **Network** screen is displayed. The device is listed as **Configured**.

Report a bug

### 8.5.5. Configuring Hypervisor Security

#### Summary

The **Security** screen is used to change the **admin** password for both local and remote access. SSH password authentication is also enabled or disabled via this screen.

**Procedure 8.17. Configuring Hypervisor Security**

1. **Enable SSH Password Authentication**

   To enable SSH password authentication for remote access select the **Enable ssh password authentication** option and press **Space** to toggle it to enabled.

2. **Change admin Password**

   a. Enter the desired **admin** password in the **Password** field. You should use a strong password.

   Strong passwords contain a mix of uppercase, lowercase, numeric and punctuation characters. They are six or more characters long and do not contain dictionary words.

   b. Enter the desired **admin** password in the **Confirm Password** field. Ensure that the value entered in the **Confirm Password** field matches the value entered in the **Password** field exactly. Where this is not the case an error message will be displayed to indicate that the two values are different.

3. Select **<Apply>** and press **Enter** to save the security configuration.

#### Result

The security configuration has been updated.

Report a bug

### 8.5.6. Configuring Hypervisor Logging

#### Summary

The Hypervisor creates and updates a number of log files. The **Logging** screen allows configuration of a daemon to automatically export these log files to a remote server.

**Procedure 8.18. Configuring Hypervisor Logging**

1. **Logrotate Configuration**

   The **logrotate** utility simplifies the administration of log files. The Hypervisor uses **logrotate** to rotate logs when they reach a certain file size.

   Log rotation involves renaming the current log(s) and starting new ones in their place. The **Logrotate Max Log Size** value set on the **Logging** screen is used to determine when a log should be rotated.

   Enter the **Logrotate Max Log Size** in kilobytes. The default maximum log size is 1024 kilobytes.
2. **Rsyslog Configuration**

   The **rsyslog** utility is a multithreaded syslog daemon. The Hypervisor is able to use **rsyslog** to transmit log files over the network to a remote syslog daemon. For information on setting up the remote syslog daemon consult the *Red Hat Enterprise Linux — Deployment Guide*.

   a. Enter the remote **rsyslog** server address in the **Server Address** field.

   b. Enter the remote **rsyslog** server port in the **Server Port** field. The default port is **514**.
3. **netconsole Configuration**

   The **netconsole** module allows kernel messages to be sent to a remote machine. The Hypervisor uses **netconsole** to transmit kernel messages over the network.

   a. Enter the **Server Address**.

   b. Enter the **Server Port**. The default port is **6666**.
4. **Save Configuration**

   To save the logging configuration select **<Apply>** and press **Enter**.

### Result

The logging configuration has been updated and logs will be exported to the remote **Rsyslog** server specified.

Report a bug

## 8.5.7. Configuring Hypervisor Simple Network Management Protocol (SNMP)

### Summary

The SNMP screen allows you to enable and configure a password for Simple Network Management Protocol.

```
SNMP
[ ] Enable SNMP

SNMP Password
Password:         ________________
Confirm Password: ________________


  <Apply>   <Reset>
```

**Procedure 8.19. Configuring Hypervisor Simple Network Management Protocol (SNMP)**

1. Select the **Enable SNMP** field.
2. Press **Space** to toggle between enabling SNMP, and disabling SNMP. By default SNMP is disabled.
3. Enter the desired SNMP **Password** for the Hypervisor.
4. Enter the desired SNMP password again in the **Confirm Password** field.
5. Select **Apply** and press **Enter** to save your changes.

### Result

SNMP is now configured.

Report a bug

## 8.5.8. Configuring Hypervisor Kernel Dumps

### Summary

The Hypervisor supports the export of kernel dumps in the event of a system failure using the **kdump** facility. The **kdump** files are able to be delivered using NFS or SSH so that they may be analyzed at a later date. The **Kernel Dump** screen provides for configuration of this facility.

**Procedure 8.20. Configuring Hypervisor Kernel Dumps**

1. Crash dumps generated by **kdump** are exported over NFS or SSH. Select the desired transfer method and press **Space** to enable it.

   For the export method chosen a location to which the **kdump** files should be exported must also be specified.

   a. **NFS location**

   Set the NFS location to which crash logs should be exported in the **NFS Location** field. The **NFS Location** should be the full NFS path which includes fully qualified domain name and directory path.

   > **Example 8.13. NFS Location**
   >
   > **example.redhat.com:/var/crash**

   b. **SSH location**

   Set the SSH location to which crash logs should be exported in the **SSH Location** field. The **SSH Location** should be the full SSH login which includes the fully qualified domain name and username.

   > **Example 8.14. SSH Location**
   >
   > **root@example.redhat.com**

2. **Save Configuration**

   To save the configuration the user must select **<Apply>** and press **Enter**.

### Result

The **Kernel Dump** configuration has been updated and kernel dumps will be exported to the remote server(s) specified.

Report a bug

## 8.5.9. Configuring Hypervisor Remote Storage

### Summary

The Hypervisor supports the use of a remote iSCSI initiator for storage. The iSCSI initiator to use is set from the **Remote Storage** screen.

**Procedure 8.21. Configuring Hypervisor Remote Storage**

1. **iSCSI Initiator Name**
   Enter the initiator name in the **iSCSI Initiator Name** field.

   > **Example 8.15. iSCSI Initiator Name**
   > **iqn.1994-05.com.redhat:5189835eeb40**

2. **Save Configuration**
   To save the configuration the user must select **<Apply>** and press **Enter**.

### Result

The **Remote Storage** configuration has been updated.

Report a bug

## 8.5.10. Configuring Hypervisor Common Information Model (CIM)

### Summary

Enabling and configuring CIM allows you to attach the Hypervisor to your pre-existing CIM management infrastructure and monitor virtual machines that are run on the Hypervisor.

**Procedure 8.22. Configuring Hypervisor Common Information Model (CIM)**

1. Select the **Enable CIM** field.

   ```
   [ ] Enable CIM
   ```

2. Enter a password in the **Password** field. This is the password that you will use to access the Hypervisor using CIM.
3. Enter the password again in the **Confirm Password** field.
4. Select the **Apply** button and press **Enter** to save your changes.

### Result

You have configured the Hypervisor to accept CIM connections authenticated using a password. Use this password when adding the Hypervisor to your Common Information Model Object Manager (CIMOM).

Report a bug

## 8.5.11. Configuring Hypervisor for Red Hat Network

### Summary

Guests running on the Hypervisor may need to consume Red Hat Enterprise Linux virtualization entitlements. Where this is the case the Hypervisor must be registered to Red Hat Network , a Satellite

server, or Subscription Asset Manager. The Hypervisor is able to connect to these services via a HTTP proxy where one is in use.

Note that when new versions of the Hypervisor itself become available they are installed from the Red Hat Enterprise Virtualization Manager, not Red Hat Network.

**Procedure 8.23. Configuring Hypervisor for Red Hat Network**

1. **Authentication**

   Enter your Red Hat Network username in the **Login** field.

   Enter your Red Hat Network password in the **Password** field.

2. **Profile Name**

   Enter the profile name to be used for the system in the **Profile Name** field. This is the name that the system will appear under when viewed in Red Hat Network.

3. **Update Source**

   The Hypervisor is able to register directly to Red Hat Network or, if available, either a Satellite installation or a Subscription Asset Manager.

   A. **To Connect Directly to RHN**

   Select the **RHN** option and press **Space** to toggle it to enabled. The **URL** and **CA** values do not need to be provided.

   **Example 8.16. Red Hat Network Configuration**

   ```
   [*] RHN [ ] Satellite [ ] Subscription Asset Manager
   URL:  _____________________________________________
   CA :  _____________________________________________
   ```

   B. **To Connect via Satellite**

      a. Select the **Satellite** option and press **Space** to toggle it to enabled.

      b. Enter the URL of the Satellite server in the **URL** field.

      c. Enter the URL of the Certificate Authority for the Satellite server in the **CA** field.

   **Example 8.17. Satellite Configuration**

   ```
   [ ] RHN [*] Satellite [ ] Subscription Asset Manager
   URL:   https://your-satellite.example.com
   CA :   https://your-satellite.example.com/pub/RHN-ORG-TRUSTED-SSL-CERT
   ```

   C. **To Connect via Subscription Asset Manager**

      a. Select the **Subscription Asset Manager** option and press **Space** to toggle it to enabled.

      b. Enter the URL of the Subscription Asset Manager server in the **URL** field.

      c. Enter the URL of the Certificate Authority for the Subscription Asset Manager server in the **CA** field.

**Example 8.18. Subscription Asset Manager Configuration**

```
[ ] RHN [ ] Satellite [*] Subscription Asset Manager
URL:  https://subscription-asset-manager.example.com
CA :  https://subscription-asset-manager.example.com/pub/RHN-ORG-
TRUSTED-SSL-CERT
```

4. **HTTP Proxy**

   Where a HTTP proxy is in use the details to connect to it must be provided. To connect to Red Hat Network or a Satellite server via a proxy you must enter:

   - the proxy **Server**'s network address,
   - the **Port** to connect to the proxy on, and
   - optionally, the **Username** and **Password** to use to connect to the proxy.

   In environments where a HTTP proxy is not in use it is safe to ignore this step.

   **Example 8.19. HTTP Proxy Configuration**

   ```
   HTTP Proxy
   Server: proxy.example.com__ Port: 8080_
   Username: puser________ Password: ******_______
   ```

5. **Save Configuration**

   To save the configuration the user must select **<Apply>** and press **Enter**.

### Result

The Hypervisor's **Red Hat Network** configuration has been updated.

Report a bug

## 8.6. Attaching the Hypervisor to the Red Hat Enterprise Virtualization Manager

### 8.6.1. Configuring Hypervisor Management Server

#### Summary

The Hypervisor is able to attach itself to the Red Hat Enterprise Virtualization Manager immediately if the address of the Manager is available. Where the Manager has not yet been installed you must instead set a password. This allows the Hypervisor to be added from the Administration Portal once the Manager has been installed. Both modes of configuration are supported from the **RHEV-M** screen in the Hypervisor user interface.

**Important**

Setting a password on the **RHEV-M** configuration screen sets the Hypervisor's **root** password and enables SSH password authentication. Once the Hypervisor has successfully been added to the Manager it is recommended SSH password authentication is disabled.

**Procedure 8.24. Configuring Hypervisor Management Server**

1. A. **Configuration Using a Management Server Address**
    a. Enter the IP address or fully qualified domain name of the Manager in the **Management Server** field.
    b. Enter the management server port in the **Management Server Port** field. The default value is **443**. Where a different port was selected during Red Hat Enterprise Virtualization Manager installation then it should be specified here, replacing the default value.
    c. Enable the **Verify RHEVM Certificate** option if you wish to verify that the finger print of the certificate retrieved from the management server you specified is correct. The value that the certificate finger print should be compared against is returned at the end of Red Hat Enterprise Virtualization Manager installation.
    d. Leave the **Password** and **Confirm Password** fields blank, these fields are not required if the address of the management server is known.

    B. **Configuration Using a Password**
    a. Enter a password in the **Password** field. It is recommended that you use a strong password. Strong passwords contain a mix of uppercase, lowercase, numeric and punctuation characters. They are six or more characters long and do not contain dictionary words.
    b. Re-enter the password in the **Confirm Password** field.
    c. Leave the **Management Server** and **Management Server Port** fields blank. As long as a password is set, allowing the Hypervisor to be added to the Manager later, these fields are not required.
2. **Save Configuration**
    To save the configuration select **<Apply>** and press **Enter**.

**Result**

The **RHEV-M** configuration has been updated.

**See Also:**

- Section 8.6.3, “Approving a Hypervisor”

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## 8.6.2. Using the Hypervisor

Where the Hypervisor was configured with the address of the Red Hat Enterprise Virtualization Manager it reboots and is automatically registered with it. The Red Hat Enterprise Virtualization Manager interface displays the Hypervisor under the **Hosts** tab. To prepare the Hypervisor for use, it must be approved using Red Hat Enterprise Virtualization Manager.

Where the Hypervisor was configured without the address of the Red Hat Enterprise Virtualization Manager it needs to be added manually. To add the Hypervisor manually you must have both the IP address of the machine upon which it was installed and the password that was set on the **RHEV-M** screen during configuration.

Report a bug

## 8.6.3. Approving a Hypervisor

### Summary

It is not possible to run virtual machines on a Hypervisor until the addition of it to the environment has been approved in Red Hat Enterprise Virtualization Manager.

**Procedure 8.25. Approving a Hypervisor**

1. Log in to the Red Hat Enterprise Virtualization Manager Administration Portal.
2. From the **Hosts** tab, click on the host to be approved. The host should currently be listed with the status of **Pending Approval**.
3. Click the **Approve** button. The **Edit and Approve Hosts** dialog displays. You can use the dialog to set a name for the host and configure power management, where the host has a supported power management card. For information on power management configuration, see the *Power Management* chapter of the *Red Hat Enterprise Virtualization — Administration Guide*.
4. Click **OK**. If you have not configured power management you will be prompted to confirm that you wish to proceed without doing so, click **OK**.

### Result

The status in the **Hosts** tab changes to **Installing**, after a brief delay the host status changes to **Up**.

Report a bug

# Chapter 9. Installing Red Hat Enterprise Linux Hosts

## 9.1. Red Hat Enterprise Linux Hosts

You can use a standard Red Hat Enterprise Linux 6 installation on capable hardware as a host. Red Hat Enterprise Virtualization supports hosts running Red Hat Enterprise Linux 6 Server AMD64/Intel 64 version.

Adding a host can take some time, as the following steps are completed by the platform: virtualization checks, installation of packages, creation of bridge and a reboot of the host. Use the Details pane to monitor the hand-shake process as the host and management system establish a connection.

**See Also:**

- Section 9.2, “Host Compatibility Matrix”

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## 9.2. Host Compatibility Matrix

| Red Hat Enterprise Linux Version | Red Hat Enterprise Virtualization 3.2 clusters in 3.0 compatibility mode | Red Hat Enterprise Virtualization 3.2 clusters in 3.1 compatibility mode | Red Hat Enterprise Virtualization 3.2 clusters |
|---|---|---|---|
| 6.2 | Supported | Unsupported | Unsupported |
| 6.3 | Supported | Supported | Unsupported |
| 6.4 | Supported | Supported | Supported |

Report a bug

## 9.3. Preparing a Red Hat Enterprise Linux Host

### 9.3.1. Installing Red Hat Enterprise Linux

#### Summary

You must install Red Hat Enterprise Linux  6 Server on a system to use it as a virtualization host in a Red Hat Enterprise Virtualization environment.

**Procedure 9.1. Installing Red Hat Enterprise Linux**

1. **Download and Install Red Hat Enterprise Linux 6 Server**

   Download and Install Red Hat Enterprise Linux 6 Server on the target virtualization host, referring to the *Red Hat Enterprise Linux 6 Installation Guide* for detailed instructions. Only the *Base* package group is required to use the virtualization host in a Red Hat Enterprise Virtualization environment.

**Important**

If you intend to use directory services for authentication on the Red Hat Enterprise Linux host then you must ensure that the authentication files required by the **useradd** command are locally accessible. The *vdsm* package, which provides software that is required for successful connection to Red Hat Enterprise Virtualization Manager, will not install correctly if these files are not locally accessible.

2. **Ensure Network Connectivity**

   Following successful installation of Red Hat Enterprise Linux 6 Server, ensure that there is network connectivity between your new Red Hat Enterprise Linux host and the system on which your Red Hat Enterprise Virtualization Manager is installed.

   a. Attempt to ping the Manager:

   ```
   # ping address of manager
   ```

   b. A. If the Manager can successfully be contacted, this displays:

   ```
   ping manager.example.redhat.com
   PING manager.example.redhat.com (192.168.0.1) 56(84) bytes of data.
   64 bytes from 192.168.0.1: icmp_seq=1 ttl=64 time=0.415 ms
   64 bytes from 192.168.0.1: icmp_seq=2 ttl=64 time=0.419 ms
   64 bytes from 192.168.0.1: icmp_seq=3 ttl=64 time=1.41 ms
   64 bytes from 192.168.0.1: icmp_seq=4 ttl=64 time=0.487 ms
   64 bytes from 192.168.0.1: icmp_seq=5 ttl=64 time=0.409 ms
   64 bytes from 192.168.0.1: icmp_seq=6 ttl=64 time=0.372 ms
   64 bytes from 192.168.0.1: icmp_seq=7 ttl=64 time=0.464 ms

   --- manager.example.redhat.com ping statistics ---
   7 packets transmitted, 7 received, 0% packet loss, time 6267ms
   ```

   B. If the Manager cannot be contacted, this displays:

   ```
   ping: unknown host manager.usersys.redhat.com
   ```

   You must configure the network so that the host can contact the Manager. First, disable **NetworkManager**. Then configure the networking scripts so that the host will acquire an ip address on boot.

   a. Disable **NetworkManager**.

   ```
   # service NetworkManager stop
   ```

   b. Edit **/etc/sysconfig/network-scripts/ifcfg-eth0**. Find this line:

   ```
   ONBOOT=no
   ```

   Change that line to this:

   ```
   ONBOOT=yes
   ```

   c. Reboot the host machine.

   d. Ping the Manager again:

```
# ping address of manager
```

If the host still cannot contact the Manager, it is possible that your host machine is not acquiring an IP address from DHCP. Confirm that DHCP is properly configured and that your host machine is properly configured to acquire an IP address from DHCP.

If the Manager can successfully be contacted, this displays:

```
ping manager.example.redhat.com
PING manager.example.redhat.com (192.168.0.1) 56(84) bytes of
data.
64 bytes from 192.168.0.1: icmp_seq=1 ttl=64 time=0.415 ms
64 bytes from 192.168.0.1: icmp_seq=2 ttl=64 time=0.419 ms
64 bytes from 192.168.0.1: icmp_seq=3 ttl=64 time=1.41 ms
64 bytes from 192.168.0.1: icmp_seq=4 ttl=64 time=0.487 ms
64 bytes from 192.168.0.1: icmp_seq=5 ttl=64 time=0.409 ms
64 bytes from 192.168.0.1: icmp_seq=6 ttl=64 time=0.372 ms
64 bytes from 192.168.0.1: icmp_seq=7 ttl=64 time=0.464 ms

--- manager.example.redhat.com ping statistics ---
7 packets transmitted, 7 received, 0% packet loss, time 6267ms
```

#### Result

You have installed Red Hat Enterprise Linux 6.3 Server. You must however complete additional configuration tasks before adding the virtualization host to your Red Hat Enterprise Virtualization environment.

**Next Step in Preparing a Red Hat Enterprise Linux Host**

- Section 9.3.2, “Subscribing to Required Channels using Subscription Manager”

Report a bug

### 9.3.2. Subscribing to Required Channels using Subscription Manager

**Previous Step in Preparing a Red Hat Enterprise Linux Host**

- Section 9.3.1, “Installing Red Hat Enterprise Linux”

#### Summary

To be used as a virtualization host, a Red Hat Enterprise Linux host must be registered and subscribed to a number of entitlements using either Subscription Manager or RHN Classic. You must follow the steps in this procedure if you wish to register and subscribe using Subscription Manager. Completion of this procedure will mean that you have:

- registered the virtualization host to Red Hat Network using Subscription Manager;
- subscribed the virtualization host to the **`Red Hat Enterprise Linux Server`** entitlement; and
- subscribed the virtualization host to the **`Red Hat Enterprise Virtualization`** entitlement.

Do *not* follow the steps in this procedure if you wish to register and subscribe using RHN Classic.

**Procedure 9.2. Subscribing to Required Channels using Subscription Manager**

1. **Register**

Run the **subscription-manager** command with the ***register*** parameter as the **root** user to register the system with Red Hat Network. To complete registration successfully you will need to supply your Red Hat Network **Username** and **Password** when prompted.

```
# subscription-manager register
```

2. **Identify entitlement pools**

   To subscribe the system to the correct entitlements you must first locate the identifiers for the required entitlement pools. Use the ***list*** action of the **subscription-manager** to find these.

   To identify available subscription pools for **Red Hat Enterprise Linux Server** use the command:

   ```
   # subscription-manager list --available | grep -A8 "Red Hat Enterprise Linux Server"
   ```

   To identify available subscription pools for **Red Hat Enterprise Virtualization** use the command:

   ```
   # subscription-manager list --available | grep -A8 "Red Hat Enterprise Virtualization"
   ```

3. **Subscribe to entitlements**

   Using the pool identifiers that you located in the previous step, subscribe the system to **Red Hat Enterprise Linux Server**, and **Red Hat Enterprise Virtualization** entitlements. Use the ***subscribe*** parameter to the **subscription-manager** command, replacing ***POOLID*** with one of the pool identifiers each time the command is run:

   ```
   # subscription-manager subscribe --pool=POOLID
   ```

### Result

You have registered the virtualization host to Red Hat Network and subscribed to the required entitlements using Subscription Manager.

**Next Step in Preparing a Red Hat Enterprise Linux Host**

- Section 9.3.3, “Subscribing to Required Channels using RHN Classic”

Report a bug

## 9.3.3. Subscribing to Required Channels using RHN Classic

**Previous Step in Preparing a Red Hat Enterprise Linux Host**

- Section 9.3.2, “Subscribing to Required Channels using Subscription Manager”

### Summary

To be used as a virtualization host, a Red Hat Enterprise Linux host must be registered and subscribed to a number of entitlements using either Subscription Manager or RHN Classic. You must follow the steps in this procedure if you wish to register and subscribe using RHN Classic. Completion of this procedure will mean that you have:

- registered the virtualization host to Red Hat Network using RHN Classic;

- subscribed the virtualization host to the **Red Hat Enterprise Linux Server (v. 6 for 64-bit AMD64 / Intel64)** channel; and
- subscribed the virtualization host to the **Red Hat Enterprise Virt Management Agent (v 6 x86_64)** channel.

Do *not* follow the steps in this procedure if you wish to register and subscribe using Subscription Manager.

**Procedure 9.3. Subscribing to Required Channels using RHN Classic**

1. **Register**

   If the machine has not already been registered with Red Hat Network, run the **rhn_register** command as **root** to register it. To complete registration successfully you will need to supply your Red Hat Network **Username** and **Password**. Follow the prompts displayed by **rhn_register** to complete registration of the system.

   ```
   # rhn_register
   ```

2. **Subscribe to channels**

   You must subscribe the system to the required channels using either the web interface to Red Hat Network or the command line **rhn-channel** command.

   A. **Using the Web Interface to Red Hat Network**

   To add a channel subscription to a system from the web interface:

   a. Log on to Red Hat Network (http://rhn.redhat.com).

   b. Move the mouse cursor over the **Subscriptions** link at the top of the screen, and then click the **Registered Systems** link in the menu that appears.

   c. Select the system to which you are adding channels from the list presented on the screen, by clicking the name of the system.

   d. Click **Alter Channel Subscriptions** in the **Subscribed Channels** section of the screen.

   e. Select the channels to be added from the list presented on the screen. To use the virtualization host in a Red Hat Enterprise Virtualization environment you must select:
      - **Red Hat Enterprise Linux Server (v. 6 for 64-bit x86_64)**; and
      - **Red Hat Enterprise Virt Management Agent (v 6 x86_64)**.

   f. Click the **Change Subscription** button to finalize the change.

   B. **Using the rhn-channel command**

   Run the **rhn-channel** command to subscribe the virtualization host to each of the required channels. The commands that need to be run are:

   ```
   # rhn-channel --add --channel=rhel-x86_64-server-6
   # rhn-channel --add --channel=rhel-x86_64-rhev-mgmt-agent-6
   ```

**Important**

If you are not the administrator for the machine as defined in Red Hat Network, or the machine is not registered to Red Hat Network, then use of the **rhn-channel** command will result in an error:

```
Error communicating with server. The message was:Error Class Code:
37
Error Class Info: You are not allowed to perform administrative tasks
on this system.
Explanation:
     An error has occurred while processing your request. If this
problem
     persists please enter a bug report at bugzilla.redhat.com.
     If you choose to submit the bug report, please be sure to
include
     details of what you were trying to do when this error occurred
and
     details on how to reproduce this problem.
```

If you encounter this error when using **rhn-channel** then to add the channel to the system you must use the web user interface instead.

### Result

You have registered the virtualization host to Red Hat Network and subscribed to the required entitlements using RHN Classic.

**Next Step in Preparing a Red Hat Enterprise Linux Host**

- Section 9.3.4, “Configuring Virtualization Host Firewall”

Report a bug

## 9.3.4. Configuring Virtualization Host Firewall

**Previous Step in Preparing a Red Hat Enterprise Linux Host**

- Section 9.3.3, “Subscribing to Required Channels using RHN Classic”

### Summary

Red Hat Enterprise Virtualization requires that a number of network ports be open to support virtual machines and remote management of the virtualization host from the Red Hat Enterprise Virtualization Manager. You must follow this procedure to open the required network ports before attempting to add the virtualization host to the Manager.

**Procedure 9.4. Configuring Virtualization Host Firewall**

The following steps configure the default firewall in Red Hat Enterprise Linux, **iptables**, to allow traffic on the required network ports. These steps replace any existing firewall configuration on your host with one containing only the required by Red Hat Enterprise Virtualization. If you have existing firewall rules with which this configuration must be merged then you must do so by manually editing the rules defined in the **iptables** configuration file, **/etc/sysconfig/iptables**.

All commands in this procedure must be run as the **root** user.

1. **Remove existing firewall rules from configuration**
   Remove any existing firewall rules using the ***--flush*** parameter to the **iptables** command.

```
# iptables --flush
```

2. **Add new firewall rules to configuration**
   Add the new firewall rules, required by Red Hat Enterprise Virtualization, using the ***--append*** parameter to the **iptables** command. The prompt character (#) has been intentionally omitted from this list of commands to allow easy copying of the content to a script file or command prompt.

```
iptables --append INPUT -m state --state ESTABLISHED,RELATED -j ACCEPT
iptables --append INPUT -p icmp -j ACCEPT
iptables --append INPUT -i lo -j ACCEPT
iptables --append INPUT -p tcp --dport 22 -j ACCEPT
iptables --append INPUT -p tcp --dport 16514 -j ACCEPT
iptables --append INPUT -p tcp --dport 54321 -j ACCEPT
iptables --append INPUT -p tcp -m multiport --dports 5634:6166 -j ACCEPT
iptables --append INPUT -p tcp -m multiport --dports 49152:49216 -j ACCEPT
iptables --append INPUT -j REJECT --reject-with icmp-host-prohibited
iptables --append FORWARD -m physdev ! --physdev-is-bridged -j REJECT \
--reject-with icmp-host-prohibited
```

**Note**

The provided **iptables** commands add firewall rules to accept network traffic on a number of ports. These include:

- port **22** for **SSH**,
- ports **5634** to **6166** for guest console connections,
- port **16514** for **libvirt** virtual machine migration traffic,
- ports **49152** to **49216** for VDSM virtual machine migration traffic, and
- port **54321** for the Red Hat Enterprise Virtualization Manager.

3. **Save the updated firewall configuration**
   Save the updated firewall configuration script using the ***save*** to the **iptables** initialization script.

```
# service iptables save
```

4. **Enable iptables service**
   Ensure that the **iptables** service is configured to start on boot and has been restarted, or started for the first time if it was not already running.

```
# chkconfig iptables on
# service iptables restart
```

### Result

You have configured the virtualization host's firewall to allow the network traffic required by Red Hat Enterprise Virtualization.

**Next Step in Preparing a Red Hat Enterprise Linux Host**

- Section 9.3.5, “Configuring Virtualization Host sudo”

**See Also:**

- Section 2.3.5.1, “Red Hat Enterprise Virtualization Manager Firewall Requirements”

Report a bug

## 9.3.5. Configuring Virtualization Host sudo

**Previous Step in Preparing a Red Hat Enterprise Linux Host**

- Section 9.3.4, “Configuring Virtualization Host Firewall”

### Summary

The Red Hat Enterprise Virtualization Manager makes use of **sudo** to perform operations as the **root** on the host. The default Red Hat Enterprise Linux configuration, stored in **/etc/sudoers**, contains values that allow this. If this file has been modified since Red Hat Enterprise Linux installation these values may have been removed. This procedure provides steps to verify that the required entry still exists in the configuration, and add the required entry if it is not present.

**Procedure 9.5. Configuring Virtualization Host sudo**

1. **Log in**
   Log in to the virtualization host as the **root** user.
2. **Run visudo**
   Run the **visudo** command to open the **/etc/sudoers**

   ```
   # visudo
   ```

3. **Edit sudoers file**
   Read the configuration file, and verify that it contains these lines:

   ```
   # Allow root to run any commands anywhere
   root    ALL=(ALL)   ALL
   ```

   If the file does not contain these lines, add them and save the file using the VIM **:w** command.
4. **Exit editor**
   Exit **visudo** using the VIM **:q** command.

### Result

You have configured **sudo** to allow use by the **root** user.

**Next Step in Preparing a Red Hat Enterprise Linux Host**

- Section 9.3.6, “Configuring Virtualization Host SSH”

Report a bug

## 9.3.6. Configuring Virtualization Host SSH

**Previous Step in Preparing a Red Hat Enterprise Linux Host**

- Section 9.3.5, “Configuring Virtualization Host sudo”

### Summary

The Red Hat Enterprise Virtualization Manager accesses virtualization hosts via SSH. To do this it logs in as the **root** user using an encrypted key for authentication. You must follow this procedure to ensure that SSH is configured to allow this.

**Warning**

The first time the Red Hat Enterprise Virtualization Manager is connected to the host it will install an authentication key. In the process it will overwrite any existing keys contained in the **/root/.ssh/authorized_keys** file.

**Procedure 9.6. Configuring virtualization host SSH**

All commands in this procedure must be run as the **root** user.

1. **Install the SSH server (*openssh-server*)**
   Install the *openssh-server* package using **yum**.

   ```
   # yum install openssh-server
   ```

2. **Edit SSH server configuration**
   Open the SSH server configuration, **/etc/ssh/sshd_config**, in a text editor. Search for the ***PermitRootLogin***.
   A. If ***PermitRootLogin*** is set to **yes**, or is not set at all, no further action is required.
   B. If ***PermitRootLogin*** is set to **no**, then you must change it to **yes**.
   Save any changes that you have made to the file, and exit the text editor.
3. **Enable the SSH server**
   Configure the SSH server to start at system boot using the **chkconfig** command.

   ```
   # chkconfig --level 345 sshd on
   ```

4. **Start the SSH server**
   Start the SSH, or restart it if it is already running, using the **service** command.

   ```
   # service sshd restart
   ```

### Result

You have configured the virtualization host to allow **root** access over SSH.

Report a bug

## 9.4. Adding a Red Hat Enterprise Linux Host

### Summary

A Red Hat Enterprise Linux host is based on a standard installation of Red Hat Enterprise Linux. The

physical host must be set up before you can add it the Red Hat Enterprise Virtualization environment.

The Red Hat Enterprise Virtualization Manager logs into the host to perform virtualization checks, install packages, create a network bridge, and reboot the host. The process of adding a new host can take up to 10 minutes.

**Procedure 9.7. Adding a Red Hat Enterprise Linux Host**

1. Click the **Hosts** resource tab to list the hosts in the results list.
2. Click **New** to open the **New Host** window.
3. Use the drop-down menus to select the **Data Center** and **Host Cluster** for the new host.
4. Enter the **Name**, **Address**, and **Root Password** of the new host.
5. If applicable, clear the **Automatically configure host firewall** check box.
6. You can configure the **Power Management** and **SPM** using the applicable tabs now; however, as these are not fundamental to adding a Red Hat Enterprise Linux host, they are not covered in this procedure.
7. Click **OK** to add the host and close the window.

**Result**

The new host displays in the list of hosts with a status of **Installing**. Once installation is complete, the status will update to **Reboot**. The host must be activated for the status to change to **Up**.

**Note**

You can view the progress of the installation in the details pane.

Report a bug

# Part IV. Environment Configuration

# Chapter 10. Planning your Data Center

## 10.1. Workflow Progress — Planning your Data Center

Report a bug

## 10.2. Planning your Data Center

Successful planning is essential for a highly available, scalable Red Hat Enterprise Virtualization environment.

Although it is assumed that your solution architect has defined the environment before installation, the following considerations must be made when designing the system.

### CPU

Virtual Machines must be distributed across hosts so that enough capacity is available to handle higher than average loads during peak processing. Average target utilization will be 50% of available CPU.

### Memory

The Red Hat Enterprise Virtualization page sharing process overcommits up to 150% of physical memory for virtual machines. Therefore, allow for an approximately 30% overcommit.

### Networking

When designing the network, it is important to ensure that the volume of traffic produced by storage, remote connections and virtual machines is taken into account. As a general rule, allow approximately 50 MBps per virtual machine.

It is best practice to separate disk I/O traffic from end-user traffic, as this reduces the load on the Ethernet connection and reduces security vulnerabilities by isolating data from the visual stream. For Ethernet networks, it is suggested that bonds (802.3ad) are utilized to aggregate server traffic types.

**Note**

It is possible to connect both the storage and Hypervisors via a single high performance switch. For this configuration to be effective, the switch must be able to provide 30 GBps on the backplane.

### High Availability

The system requires at least two hosts to achieve high availability. This redundancy is useful when performing maintenance or repairs.

Report a bug

## 10.3. Data Centers

### 10.3.1. Data Centers in Red Hat Enterprise Virtualization

The data center is the highest level container for all physical and logical resources within a managed virtual environment. The data center is a collection of clusters of Hosts. It owns the logical network (that is, the defined subnets for management, guest network traffic and storage network traffic) and the storage pool.

Red Hat Enterprise Virtualization contains a **`Default`** data center at installation. You can create new data centers that will also be managed from the single Administration Portal. For example, you may choose to have different data centers for different physical locations, business units, or for reasons of security. It is recommended that you do not remove the **`Default`** data center, instead set up new appropriately named data centers.

The system administrator, as the superuser, can manage all aspects of the platform, that is, data centers, storage domains, users, roles and permissions by default; however more specific administrative roles and permissions can be assigned to other users. For example, the enterprise may need a Data Center administrator for a specific data center, or a particular cluster may need an administrator. All system administration roles for physical resources have a hierarchical permission system. For example, a data center administrator will automatically have permission to manage all the objects in that data center - including storage domains, clusters and hosts.

**See Also:**

- Section 10.3.2, “Creating a New Data Center”
- Section 10.4.1, “Clusters in Red Hat Enterprise Virtualization”

Report a bug

### 10.3.2. Creating a New Data Center

#### Summary

This procedure creates a data center in your virtualization environment. The data center requires a functioning cluster, host, and storage domain to operate.

**Note**

The storage **Type** can be edited until the first storage domain is added to the data center. Once a storage domain has been added, the storage **Type** cannot be changed.
If you set the **Compatibility Version** as **3.1**, it cannot be changed to **3.0** at a later time; version regression is not allowed.

**Procedure 10.1. Creating a New Data Center**

1. Select the **Data Centers** resource tab to list all data centers in the results list.
2. Click **New** to open the **New Data Center** window.
3. Enter the **Name** and **Description** of the data center.
4. Select the storage **Type**, **Compatibility Version**, and **Quota Mode** of the data center from the drop-down menus.
5. Click **OK** to create the data center and open the **New Data Center - Guide Me** window.
6. The **Guide Me** window lists the entities that need to be configured for the data center. Configure these entities or postpone configuration by clicking the **Configure Later** button; configuration can be resumed by selecting the data center and clicking the **Guide Me** button.

#### Result

The new data center is added to the virtualization environment. It will remain **Uninitialized** until a cluster, host, and storage domain is configured for it; use **Guide Me** to configure these entities.

**See Also:**

- Section 10.3.1, “Data Centers in Red Hat Enterprise Virtualization”

Report a bug

## 10.4. Clusters

### 10.4.1. Clusters in Red Hat Enterprise Virtualization

A cluster is a collection of physical hosts that share similar characteristics and work together to provide computing resources in a highly available manner. In Red Hat Enterprise Virtualization the cluster must contain physical hosts that share the same storage domains and have the same type of CPU. Because virtual machines can be migrated across hosts in the same cluster, the cluster is the highest level at which power and load-sharing policies can be defined. The Red Hat Enterprise Virtualization platform contains a **Default** cluster in the **Default** data center at installation time.

Every cluster in the system must belong to a data center, and every host in the system must belong to a cluster. This enables the system to dynamically allocate a virtual machine to any host in the cluster, according to policies defined on the **Cluster** tab, thus maximizing memory and disk space, as well as

virtual machine uptime.

At any given time, after a virtual machine runs on a specific host in the cluster, the virtual machine can be migrated to another host in the cluster using **Migrate**. This can be very useful when a host must be shut down for maintenance. The migration to another host in the cluster is transparent to the user, and the user continues working as usual. Note that a virtual machine can not be migrated to a host outside the cluster.

**Note**

Red Hat Enterprise Virtualization 3.1 supports the use of clusters to manage Gluster storage bricks, in addition to virtualization hosts. To begin managing Gluster storage bricks, create a cluster with the **Enable Gluster Service** option selected. For further information on Gluster storage bricks, refer to the Red Hat Enterprise Storage *Administration Guide*, available at http://docs.redhat.com/.

**Note**

Red Hat Enterprise Virtualization supports **Memory Optimization** by enabling and tuning Kernel Same-page Merging (KSM) on the virtualization hosts in the cluster. For more information on KSM refer to the Red Hat Enterprise Linux 6 *Virtualization Administration Guide*.

**See Also:**

- Section 10.4.2, “Creating a New Cluster”
- Section 10.3.1, “Data Centers in Red Hat Enterprise Virtualization”

Report a bug

## 10.4.2. Creating a New Cluster

### Summary

A data center can contain multiple clusters and a cluster can hold multiple hosts. All hosts in a cluster must run the same CPU type (Intel or AMD). It is recommended that you create your hosts before you create your cluster to ensure CPU type optimization; however, you can configure the hosts at a later time using the **Guide Me** button.

**Important**

The default **rhevm** network cannot be modified once a Cluster has been attached to a data center. Perform all configuration for the **rhevm** network, such as enabling VLAN tagging, before a Cluster is attached and while the data center remains in the **Uninitialized** state.

**Procedure 10.2. Creating a New Cluster**

1. Select the **Clusters** resource tab to list all clusters in the results list.
2. Click **New** to open the **New Cluster** window.
3. Select the **Data Center** the cluster will belong to from the drop-down menu.

4. Enter the **Name** and **Description** of the cluster.
5. Select the **CPU Name** and **Compatibility Version** from the drop-down menus. It is important to match the CPU processor family with the minimum CPU processor type of the hosts you intend to attach to the cluster, otherwise the host will be non-operational.
6. Tick either the **Enable Virt Service** or **Enable Gluster Service** check boxes, depending on whether the cluster should be populated with virtual machine hosts or Gluster-enabled nodes. Note that you cannot add Red Hat Enterprise Virtualization Hypervisor hosts to a Gluster-enabled cluster.
7. Click the **Optimization** tab to select the memory page sharing threshold for the cluster, and optionally enable CPU thread handling on the cluster's hosts.
8. Click the **Resilience Policy** tab to select the virtual machine migration policy.
9. Click **OK** to create the cluster and open the **New Cluster - Guide Me** window.
10. The **Guide Me** window lists the entities that need to be configured for the cluster. Configure these entities or postpone configuration by clicking the **Configure Later** button; configuration can be resumed by selecting the cluster and clicking the **Guide Me** button.

### Result

The new cluster is added to the virtualization environment.

**See Also:**

- Section 10.4.1, “Clusters in Red Hat Enterprise Virtualization”

Report a bug

# Chapter 11. Network Setup

## 11.1. Workflow Progress — Network Setup

Report a bug

## 11.2. Networking in Red Hat Enterprise Virtualization

Red Hat Enterprise Virtualization uses networking to support almost every aspect of operations. Storage, host management, user connections, and virtual machine connectivity, for example, all rely on a well planned and configured network to deliver optimal performance. Setting up networking is a vital prerequisite for a Red Hat Enterprise Virtualization environment because it is much simpler to plan for your projected networking requirements and implement your network accordingly than it is to discover your networking requirements through use and attempt to alter your network configuration retroactively.

It is however possible to deploy a Red Hat Enterprise Virtualization environment with no consideration given to networking at all. Simply ensuring that each physical machine in the environment has at least one *Network Interface Controller* (NIC) is enough to begin using Red Hat Enterprise Virtualization. While it is true that this approach to networking will provide a functional environment, it will not provide an optimal environment. As network usage varies by task or action, grouping related tasks or functions into specialized networks can improve performance while simplifying the troubleshooting of network issues.

Red Hat Enterprise Virtualization separates network traffic by defining logical networks. Logical networks define the path that a selected network traffic type must take through the network. They are created to isolate network traffic by functionality or virtualize a physical topology.

The **rhevm** logical network is created by default and labeled as the **Management**. The **rhevm** logical network is intended for management traffic between the Red Hat Enterprise Virtualization Manager and virtualization hosts. You are able to define additional logical networks to segregate:

- Display related network traffic.
- General virtual machine network traffic.
- Storage related network traffic.

For optimal performance it is recommended that these traffic types be separated using logical networks. Logical networks may be supported using physical devices such as NICs or logical devices, such as network bonds. It is not necessary to have one device for each logical network as multiple logical networks are able to share a single device. This is accomplished using Virtual LAN (VLAN) tagging to isolate network traffic. To make use of this facility VLAN tagging must also be supported at the switch level.

The limits that apply to the number of logical networks that you may define in a Red Hat Enterprise Virtualization environment are:

- The number of logical networks attached to a host is limited to the number of available network devices combined with the maximum number of Virtual LANs (VLANs) which is 4096.
- The number of logical networks in a cluster is limited to the number of logical networks that can be attached to a host as networking must be the same for all hosts in a cluster.
- The number of logical networks in a data center is limited only by the number of clusters it contains in combination with the number of logical networks permitted per cluster.

**Note**

A familiarity with the network concepts and their use is highly recommended when planning and setting up networking in a Red Hat Enterprise Virtualization environment. This document does not describe the concepts, protocols, requirements or general usage of networking. It is recommended that you read your network hardware vendor's guides for more information on managing networking.

**Important**

Additional care must be taken when modifying the properties of the **rhevm** network. Incorrect changes to the properties of the **rhevm** network may cause hosts to become temporarily unreachable.

**Important**

If you plan to use Red Hat Enterprise Virtualization nodes to provide any services, remember that the services will stop if the Red Hat Enterprise Virtualization environment stops operating.
This applies to all services, but you should be fully aware of the hazards of running the following on Red Hat Enterprise Virtualization:

- Directory Services
- DNS
- Storage

**See Also:**

- Section 11.3, “Logical Networks”
- Section 11.4, “Bonds”

Report a bug

# 11.3. Logical Networks

## 11.3.1. Creating a New Logical Network in a Data Center or Cluster

### Summary

Create a logical network and define its use in the data center, or clusters in a data center.

**Procedure 11.1. Defining Logical Networks in a Cluster**

1. Use the **Data Centers** or **Clusters** resource tabs, tree mode, or the search function to find and select the resource in the results list.
2. Click the **Logical Networks** tab of the details pane to list the existing logical networks.
3. Click **New** in the **Data Centers** details pane to open the **New Logical Network** window.
   Click **Add Network** in the **Clusters** details pane to open the **New Logical Network** window.

**Figure 11.1. New Logical Network**

4. Enter the **Name** and **Description** of the logical network.
5. Select the check boxes to enable a **VM Network**, **Enable VLAN tagging**, and **Override MTU**.
6. Select the cluster(s) you want to assign the network to. Note that the network is added as required Network to the selected clusters.
7. Tick the **Allow all users to use this Network** checkbox to confer permissions for the new network to all users.
8. Click **OK** to create the logical network.

### Result

You have defined this logical network as a resource required by a cluster or clusters in the data center. You can now add this resource to the hosts in the cluster.

**See Also:**

- Section 10.3.1, “Data Centers in Red Hat Enterprise Virtualization”
- Section 10.4.1, “Clusters in Red Hat Enterprise Virtualization”

Report a bug

## 11.3.2. Editing Host Network Interfaces and Adding Logical Networks to Hosts

### Summary

You can change the settings of host network interfaces. Moving the **rhevm** management logical network between interfaces, and adding a newly created logical network to a network interface are common reasons to edit host networking.

**Procedure 11.2. Editing Host Network Interfaces and Adding Logical Networks to Hosts**

1. Use the **Hosts** resource tab, tree mode, or the search function to find and select the host in the results.
2. Click the **Network Interfaces** tab in the details pane to list the network interfaces attached to the host and their configurations.
3. Click the **Setup Host Networks** button to open the **Setup Host Networks** window.

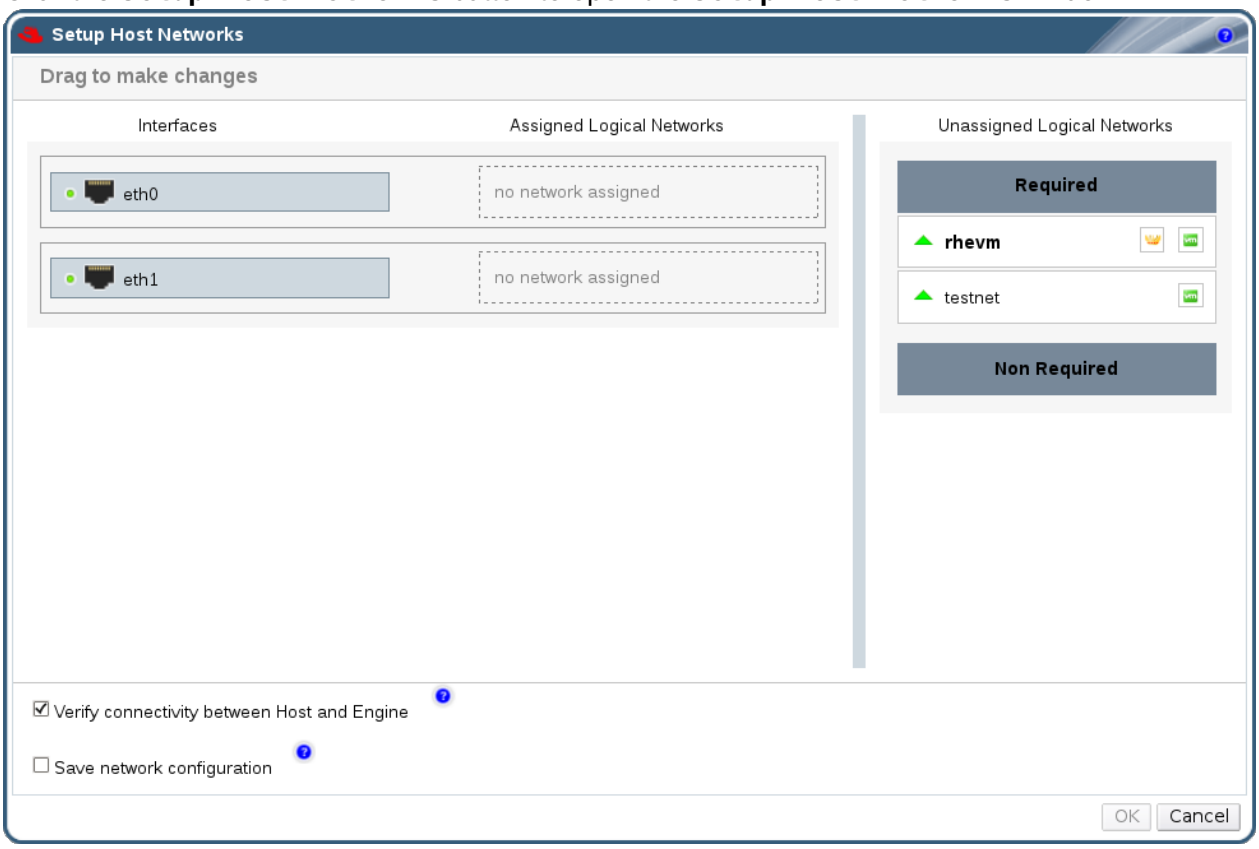


**Figure 11.2. The Setup Host Networks window**

4. Attach a logical network to a network interface by selecting and dragging a logical network into the **Assigned Logical Networks** area next to the network interface.

   Alternatively, right-click the logical network and select a network interface from the drop-down menu.
5. Edit the logical networks by hovering your cursor over an assigned logical network and clicking the pencil icon to open the **Edit Network** window.

   If your logical network definition is not synchronized with the network configuration on the host, select the **Sync network** check box.

   Select a **Boot Protocol** from:
   - **None**,
   - **DHCP**, or
   - **Static**.

If you have chosen **Static**, provide the **IP** and **Subnet Mask**.

Click **OK**.

6. Select the **Verify connectivity between Host and Engine** check box to run a network check; this will only work if the host is in maintenance mode.
7. Select the **Save network configuration** check box if you want these network changes to be made persistent when the environment is rebooted.
8. Click **OK** to implement the changes and close the window.

### Result

You have assigned logical networks to network interfaces and configured the host network.

Report a bug

## 11.3.3. Designating a Logical Network for a Specific Traffic Type in Red Hat Enterprise Virtualization Manager

### Summary

A Logical Network created to carry specific network traffic must be designated as such using the Administration Portal. To designate a Logical Network for specific network traffic:

**Procedure 11.3. Designating a Logical Network for a Specific Traffic Type in Red Hat Enterprise Virtualization Manager**

1. Select the **Clusters** tab, and select the Cluster the Logical Network is attached to.
2. Select the **Logical Networks** sub-tab.
3. Click the **Assign/UnAssign Networks** button.
4. The **Assign/UnAssign Networks** dialog appears. Each Logical Network associated with the Cluster is listed. Additionally alongside each Logical Network these options are shown:
   - **Assign** — When selected, the Logical Network is assigned to the Cluster. De-selecting the option unassigns the Logical Network from the Cluster. Do not unassign the Logical Network if there are active hosts within the Cluster. Ensure that the **Assign** option is selected for the Logical Network that you want to assign network traffic to.
   - **Required** — When selected, the Logical Network is considered mandatory for Cluster operation. Hosts that are not attached to the Logical Network, and therefore not candidates for migration of Virtual Machines from hosts that are attached to the Logical Network, will be marked non-operational. This was the default behaviour for all Logical Networks assigned to a Cluster in previous versions of Red Hat Enterprise Virtualization.
   - **VM Network** — When selected, the Logical Network is used for all Virtual Machine network traffic, excluding console connections.
   - **Display Network** — When selected the Logical Network is used for all network traffic generated by console connections to Virtual Machines.

   Select the desired options for each Logical Network shown, then click **OK**.

### Result

You have successfully designated a Logical Network for a specific network traffic type.

Report a bug

# 11.4. Bonds

## 11.4.1. Bonding Modes

Red Hat Enterprise Virtualization supports the following common bonding modes:

- Mode 0 (round-robin policy) transmits packets to interfaces in sequential order. Packet transmission occurs in iterations that begin with the first available interface and end with the last available interface. Similarly, all subsequent iterations initiate with the first available interface. Mode 0 offers fault tolerance and load balancing to the network. However, mode 0 cannot be used in conjunction with bridges, therefore it is not compatible with virtual machine logical networks.
- Mode 1 (active-backup policy) sets all interfaces to the backup state while one remains active. Upon failure on the active interface, a backup interface replaces it as the only active interface in the bond. The MAC address of the bond in mode 1 is visible on only one port (the network adapter), to prevent confusion for the switch. Mode 1 provides fault tolerance and is supported in Red Hat Enterprise Virtualization.
- Mode 2 (XOR policy) selects an interface to transmit packages to based on the result of an XOR operation on the source and destination MAC addresses modulo NIC slave count. This calculation ensures that the same interface is selected for each destination MAC address used. Mode 2 provides fault tolerance and load balancing and is supported in Red Hat Enterprise Virtualization.
- Mode 3 (broadcast policy) transmits all packages to all interfaces. Mode 3 provides fault tolerance and is supported in Red Hat Enterprise Virtualization.
- Mode 4 (IEEE 802.3ad policy) creates aggregation groups for which included interfaces share the speed and duplex settings. Mode 4 uses all interfaces in the active aggregation group in accordance with the IEEE 802.3ad specification and is supported in Red Hat Enterprise Virtualization.
- Mode 5 (adaptive transmit load balancing policy) ensures the outgoing traffic distribution is according to the load on each interface and that the current interface receives all incoming traffic. If the interface assigned to receive traffic fails, another interface is assigned the receiving role instead. Mode 5 is supported in Red Hat Enterprise Virtualization.
- Mode 6 (adaptive load balancing policy)combines mode 5 (adaptive transmit load balancing policy) with receive load balancing for IPV4 traffic without any special switch requirements. ARP negotiation is used for balancing the receive load. Mode 6 cannot be used in conjunction with bridges, therefore it is not compatible with virtual machine logical networks.

Report a bug

## 11.4.2. Creating a Bond Device using the Administration Portal

### Summary

You can bond two network interfaces of the same make and model together using one of the 4 supported bonding modes. This type of configuration can increase available bandwidth and reliability.

**Note**

If you would like to use the bond device to carry the **rhevm** management network with VLAN tagging enabled, please see *Red Hat KB43070*.

**Procedure 11.4. Creating a Bond Device using the Administration Portal**

1. Use the **Hosts** resource tab, tree mode, or the search function to find and select the host in the

results list.

2. Click the **Network Interfaces** tab in the details pane to list the physical network interfaces attached to the host.
3. Click **Setup Host Networks** to open the **Setup Host Networks** window.
4. Select and drag one of the interfaces over the top of another interface and drop it to open the **Create New Bond** window.

   Alternatively, right-click the interface and select another interface from the drop-down menu.

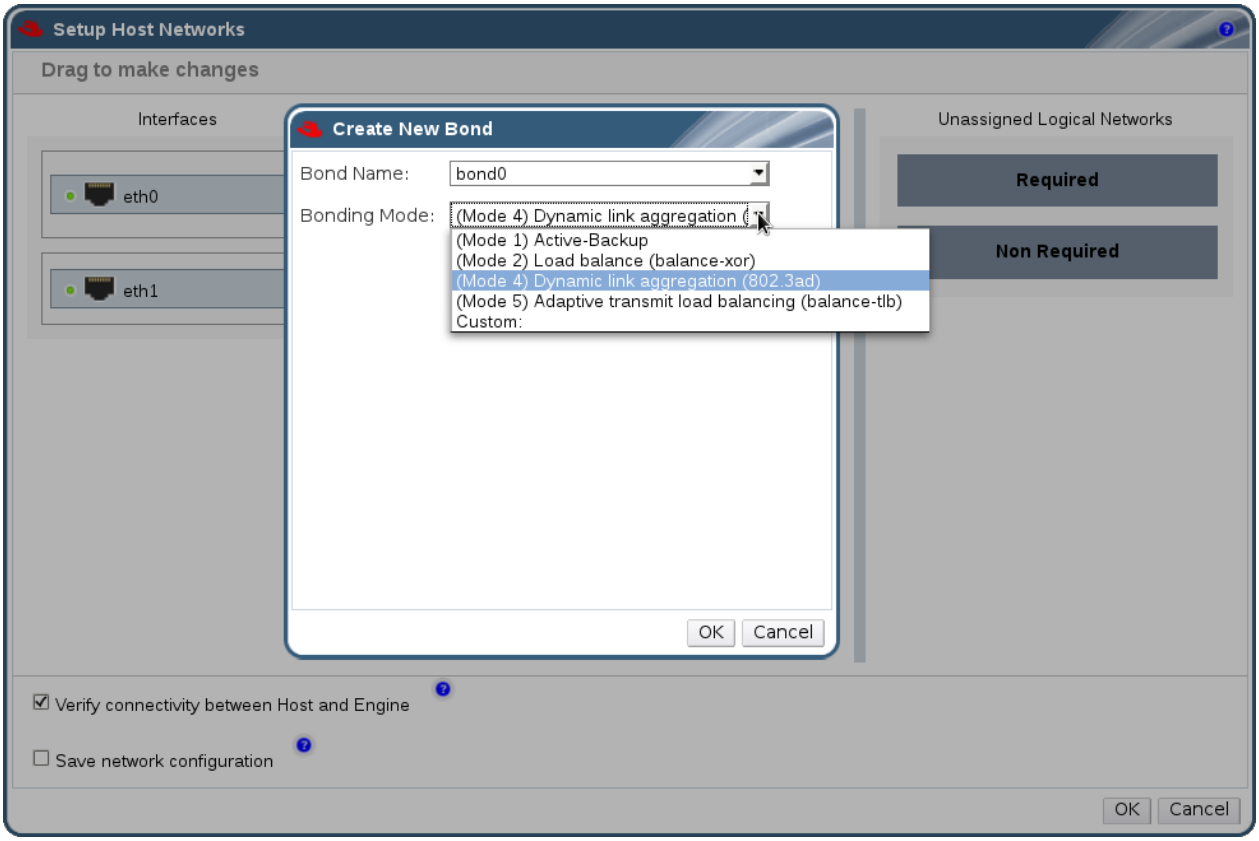


**Figure 11.3. Bond Devices Window**

5. Select the **Bond Name** and **Bonding Mode** from the drop-down menus.

   Bonding modes 1, 2, 4, and 5 can be selected. Any other mode can be configured using the **Custom** option.
6. Click **OK** to create the bond and close the **Create New Bond** window.
7. Assign a logical network to the newly created bonded interface.
8. Optionally choose to **Verify connectivity between Host and Engine** and **Save network configuration**.
9. Click **OK** accept the changes and close the **Setup Host Networks** window.

**Result:**

Your two interfaces are a linked bond device and can be edited as a single interface. The bond device lists in the **Network Interfaces** tab of the details pane for the selected host.

Bonding must be enabled for the ports of the switch used by the host. The process by which bonding is enabled is slightly different for each switch; consult the manual provided by your switch vendor for detailed information on how to enable bonding.

Report a bug

### 11.4.3. Switch Configuration for Bonding

The following is an bond example configuration for a switch. Your switch configuration may look different.

```
interface Port-channel11
switchport access vlan 153
switchport mode access
spanning-tree portfast disable
spanning-tree bpduguard disable
spanning-tree guard root

interface GigabitEthernet0/16
switchport access vlan 153
switchport mode access
channel-group 11 mode active

interface GigabitEthernet0/17
switchport access vlan 153
switchport mode access
```

**Important**

For every type of switch it is important to set up the switch bonding with the *Link Aggregation Control Protocol* (LACP) protocol and *not* the Cisco *Port Aggregation Protocol* (PAgP) protocol.

Report a bug

# Chapter 12. Storage Setup

## 12.1. Workflow Progress — Storage Setup

Report a bug

## 12.2. Introduction to Storage in Red Hat Enterprise Virtualization

Red Hat Enterprise Virtualization uses a centralized storage system for virtual machine disk images, ISO files and snapshots. Storage networking can be implemented using:

- Network File System (NFS).
- Other POSIX compliant file systems.
- Internet Small Computer System Interface (iSCSI).
- Local storage attached directly to the virtualization hosts.
- Fibre Channel Protocol (FCP).

Setting up storage is a prerequisite for a new data center because a data center cannot be initialized unless storage domains are attached and activated.

As a Red Hat Enterprise Virtualization system administrator, you need to create, configure, attach and maintain storage for the virtualized enterprise. You should be familiar with the storage types and their

use. Read your storage array vendor's guides, and refer to the *Red Hat Enterprise Linux Storage Administration Guide* for more information on the concepts, protocols, requirements or general usage of storage.

The Red Hat Enterprise Virtualization platform enables you to assign and manage storage using the Administration Portal's **Storage** tab. The **Storage** results list displays all the storage domains, and the details pane shows general information about the domain.

Red Hat Enterprise Virtualization platform has three types of storage domains:

- **Data Domain:** A data domain holds the virtual hard disks and OVF files of all the virtual machines and templates in a data center. In addition, snapshots of the virtual machines are also stored in the data domain.

  The data domain cannot be shared across data centers, and the data domain must be of the same type as the data center. For example, a data center of a iSCSI type, must have an iSCSI data domain.

  You must attach a data domain to a data center before you can attach domains of other types to it.
- **ISO Domain:** ISO domains store ISO files (or logical CDs) used to install and boot operating systems and applications for the virtual machines. An ISO domain removes the data center's need for physical media. An ISO domain can be shared across different data centers. ISO storage domains use NFS storage.
- **Export Domain:** Export domains are temporary storage repositories that are used to copy and move images between data centers and Red Hat Enterprise Virtualization environments. Export domains can be used to backup virtual machines. An export domain can be moved between data centers, however, it can only be active in one data center at a time.

**Important**

Support for export storage domains backed by storage on anything other than NFS is being deprecated. While existing export storage domains imported from Red Hat Enterprise Virtualization 2.2 environments remain supported new export storage domains must be created on NFS storage.

Only commence configuring and attaching storage for your Red Hat Enterprise Virtualization environment once you have determined the storage needs of your data center(s).

**Important**

To add storage domains you must be able to successfully access the Administration Portal, and there must be at least one host connected with a status of **Up**.

**See Also:**

- Section 12.3.1, “Adding NFS Storage”
- Section 12.3.3, “Adding iSCSI Storage”
- Section 12.3.4, “Adding FCP Storage”
- Section 12.3.5, “Adding Local Storage”
- Section 12.3.6, “Adding POSIX Compliant File System Storage”
- Section 12.4, “Populating the ISO Domain”

Report a bug

# 12.3. Adding Storage to the Environment

## 12.3.1. Adding NFS Storage

### 12.3.1.1. Preparing NFS Storage

#### Summary

These steps must be taken to prepare an NFS file share on a server running Red Hat Enterprise Linux 6 for use with Red Hat Enterprise Virtualization.

**Procedure 12.1. Preparing NFS Storage**

1. **Install *nfs-utils***

   NFS functionality is provided by the *nfs-utils* package. Before file shares can be created, check that the package is installed by querying the RPM database for the system:

   ```
   $ rpm -qi nfs-utils
   ```

   If the *nfs-utils* package is installed then the package information will be displayed. If no output is displayed then the package is not currently installed. Install it using **yum** while logged in as the **root** user:

   ```
   # yum install nfs-utils
   ```

2. **Configure Boot Scripts**

   To ensure that NFS shares are always available when the system is operational both the **nfs** and **rpcbind** services must start at boot time. Use the **chkconfig** command while logged in as **root** to modify the boot scripts.

   ```
   # chkconfig --add rpcbind
   # chkconfig --add nfs
   # chkconfig rpcbind on
   # chkconfig nfs on
   ```

   Once the boot script configuration has been done, start the services for the first time.

   ```
   # service rpcbind start
   # service nfs start
   ```

3. **Create Directory**

   Create the directory you wish to share using NFS.

   ```
   # mkdir /exports/iso
   ```

   Replace ***/exports/iso*** with the name, and path of the directory you wish to use.

4. **Export Directory**

   To be accessible over the network using NFS the directory must be exported. NFS exports are controlled using the **/etc/exports** configuration file. Each export path appears on a separate line followed by a tab character and any additional NFS options. Exports to be attached to the Red Hat Enterprise Virtualization Manager must have the read, and write, options set.

To grant read, and write access to **/exports/iso** using NFS for example you add the following line to the **/etc/exports** file.

```
/exports/iso        *(rw)
```

Again, replace ***/exports/iso*** with the name, and path of the directory you wish to use.

5. **Reload NFS Configuration**

   For the changes to the **/etc/exports** file to take effect the service must be told to reload the configuration. To force the service to reload the configuration run the following command as **root**:

   ```
   # service nfs reload
   ```

6. **Set Permissions**

   The NFS export directory must be configured for read write access and must be owned by vdsm:kvm. If these users do not exist on your external NFS server use the following command, assuming that ***/exports/iso*** is the directory to be used as an NFS share.

   ```
   # chown -R 36:36 /exports/iso
   ```

   The permissions on the directory must be set to allow read and write access to both the owner and the group. The owner should also have execute access to the directory. The permissions are set using the **chmod** command. The following command arguments set the required permissions on the ***/exports/iso*** directory.

   ```
   # chmod 0755 /exports/iso
   ```

### Result

The NFS file share has been created, and is ready to be attached by the Red Hat Enterprise Virtualization Manager.

Report a bug

### 12.3.1.2. Attaching NFS Storage

**Prerequisites:**

- Section 12.3.1.1, “Preparing NFS Storage”

### Summary

An NFS type **Storage Domain** is a mounted NFS share that is attached to a data center. It is used to provide storage for virtualized guest images and ISO boot media. Once NFS storage has been exported it must be attached to the Red Hat Enterprise Virtualization Manager using the Administration Portal.

NFS data domains can be added to NFS data centers. You can add NFS, ISO, and export storage domains to data centers of any type.

**Procedure 12.2. Attaching NFS Storage**

1. Click the **Storage** resource tab to list the existing storage domains.
2. Click **New Domain** to open the **New Domain** window.

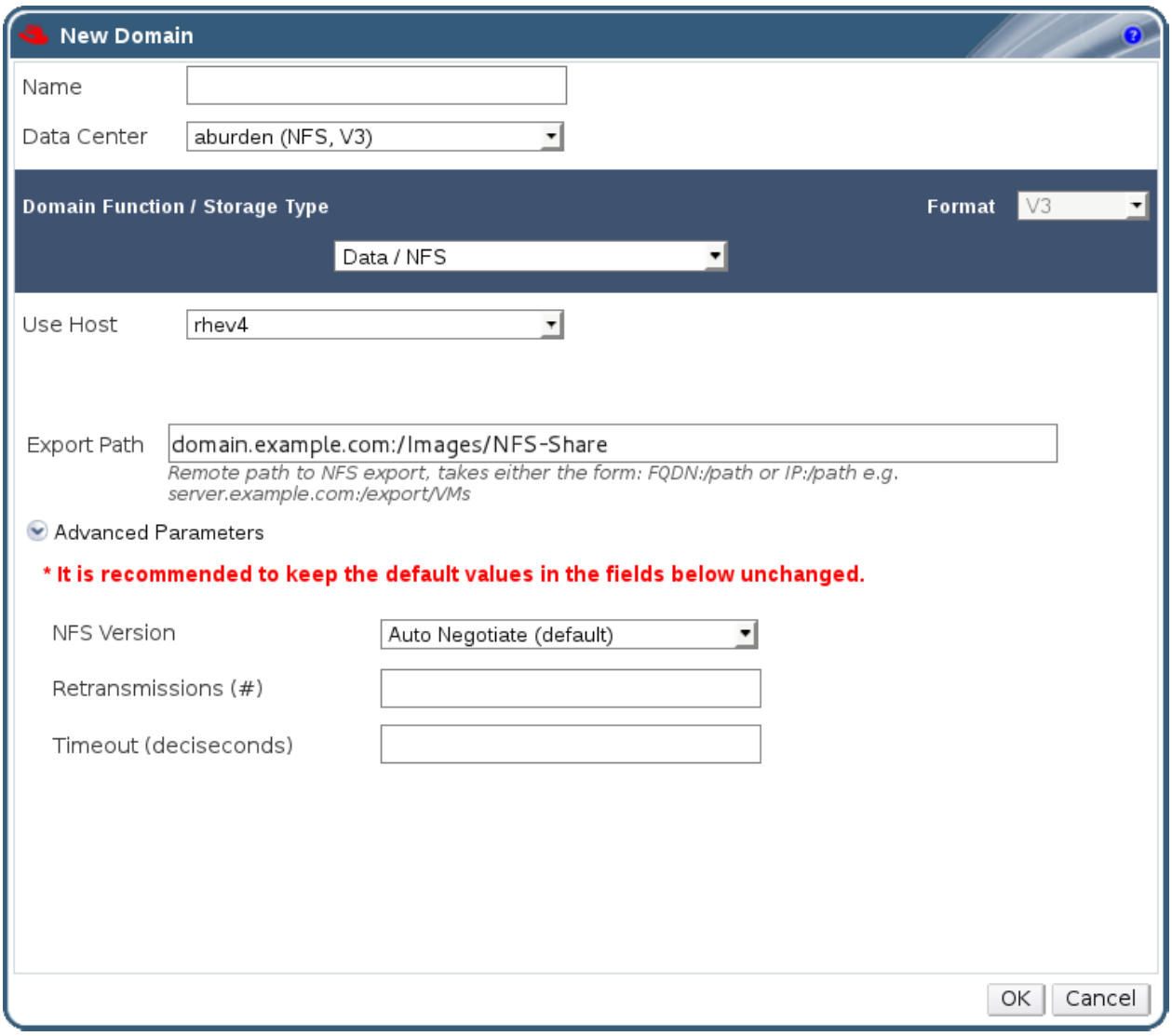


**Figure 12.1. NFS Storage**

3. Enter the **Name** of the storage domain.
4. Select the **Data Center**, **Domain Function / Storage Type**, and **Use Host** from the drop-down menus.

   If applicable, select the **Format** from the drop-down menu.
5. Enter the **Export Path** to be used for the storage domain.

   The export path should be in the format of **192.168.0.10:/data or domain.example.com:/data**
6. Click **Advanced Parameters** to enable further configurable settings. It is recommended that the values of these parameters not be modified.

**Important**

All communication to the storage domain is from the selected host and not directly from the Red Hat Enterprise Virtualization Manager. At least one active host must be attached to the chosen Data Center before the storage is configured.

7. Click **OK** to create the storage domain and close the window.

### Result

The new NFS data domain is displayed on the **Storage** tab with a status of **Locked** while the disk prepares. It is automatically attached to the data center upon completion.

Report a bug

## 12.3.2. Preparing iSCSI Storage

### Summary

These steps must be taken to export iSCSI storage device from a server running Red Hat Enterprise Linux 6 to use as a storage domain with Red Hat Enterprise Virtualization.

**Procedure 12.3. Preparing iSCSI Storage**

1. Install the **scsi-target-utils** package using the **yum** command as root on your storage server.

```
# yum install -y scsi-target-utils
```

2. Add the devices or files you want to export to the **/etc/tgt/targets.conf** file. Here is a generic example of a basic addition to the **targets.conf** file:

```
<target iqn.YEAR-MONTH.com.EXAMPLE:SERVER.targetX>
          backing-store /PATH/TO/DEVICE1 # Becomes LUN 1
          backing-store /PATH/TO/DEVICE2 # Becomes LUN 2
          backing-store /PATH/TO/DEVICE3 # Becomes LUN 3
</target>
```

   Targets are conventionally defined using the year and month they are created, the reversed fully qualified domain that the server is in, the server name, and a target number.

3. Start the **tgtd** service.

```
# service tgtd start
```

4. Make the **tgtd** start persistently across reboots.

```
# chkconfig tgtd on
```

5. Open an iptables firewall port to allow clients to access your iSCSI export. By default, iSCSI uses port 3260. This example inserts a firewall rule at position 6 in the INPUT table.

```
# iptables -I INPUT 6 -p tcp --dport 3260 -j ACCEPT
```

6. Save the iptables rule you just created.

```
# service iptables save
```

### Result

You have created a basic iSCSI export. You can use it as an iSCSI data domain.

Report a bug

## 12.3.3. Adding iSCSI Storage

### Summary

Red Hat Enterprise Virtualization platform supports iSCSI storage by creating a storage domain from a volume group made of pre-existing LUNs. Neither volume groups nor LUNs can be attached to more than one storage domain at a time.

For information regarding the setup and configuration of iSCSI on Red Hat Enterprise Linux, see the *Red Hat Enterprise Linux Storage Administration Guide*.

**Note**

You can only add an iSCSI storage domain to a data center that is set up for iSCSI storage type.

**Procedure 12.4. Adding iSCSI Storage**

1. Click the **Storage** resource tab to list the existing storage domains in the results list.
2. Click the **New Domain** button to open the **New Domain** window.
3. Enter the **Name** of the new storage domain.

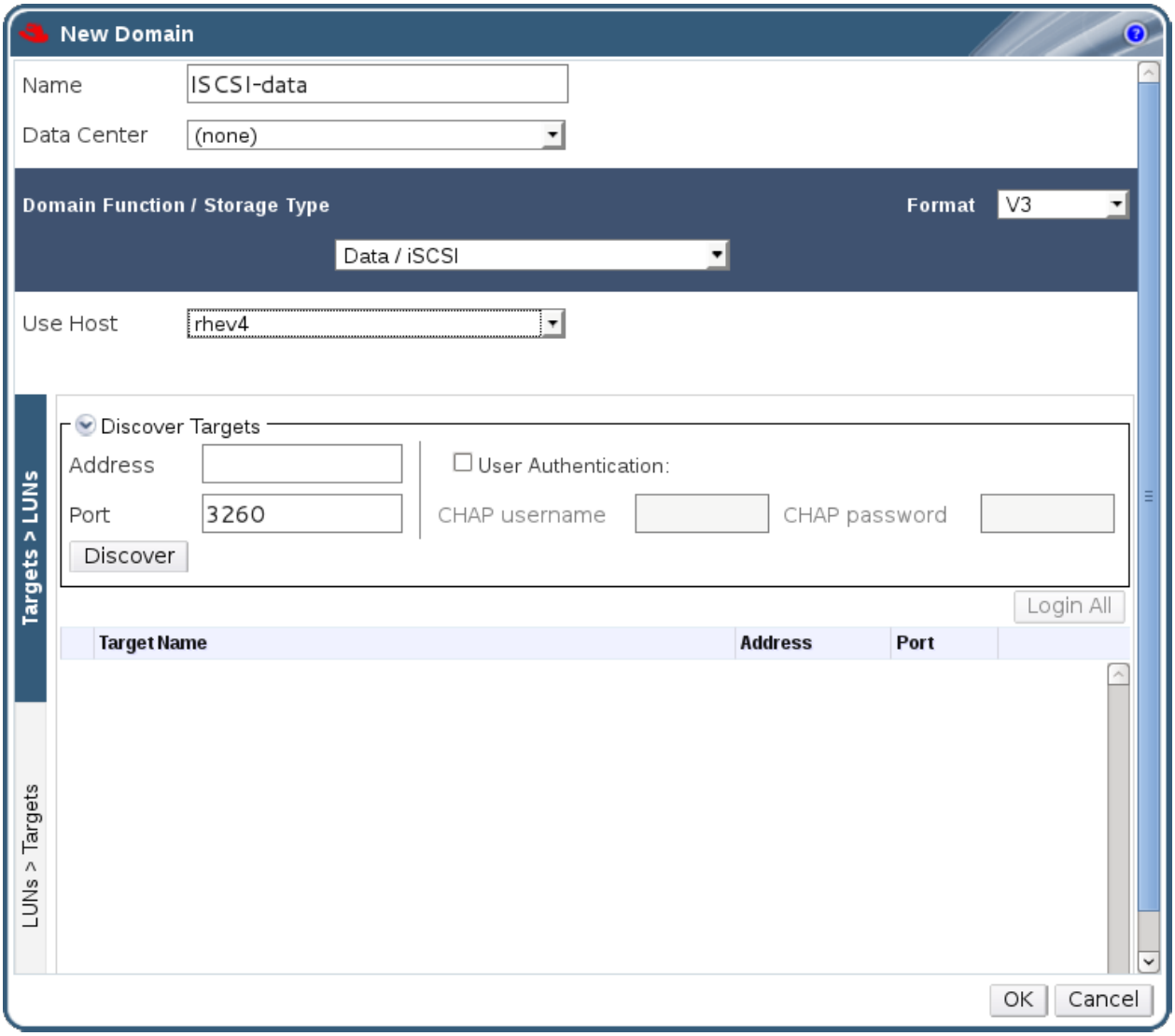


**Figure 12.2. New iSCSI Domain**

4. Use the **Data Center** drop-down menu to select an iSCSI data center.

   If you do not yet have an appropriate iSCSI data center, select **(none)**.
5. Use the drop-down menus to select the **Domain Function / Storage Type** and the **Format**. The storage domain types that are not compatible with the chosen data center are not available.
6. Select an active host in the **Use Host** field. If this is not the first data domain in a data center, you must select the data center's SPM host.

   **Important**

   All communication to the storage domain is via the selected host and not directly from the Red Hat Enterprise Virtualization Manager. At least one active host must exist in the system, and be attached to the chosen data center, before the storage is configured.

7. The Red Hat Enterprise Virtualization Manager is able to map either iSCSI targets to LUNs, or LUNs to iSCSI targets. The **New Domain** window automatically displays known targets with unused LUNs when iSCSI is selected as the storage type. If the target that you are adding storage from is not listed then you can use target discovery to find it, otherwise proceed to the next step.

   **iSCSI Target Discovery**

   a. Click **Discover Targets** to enable target discovery options. When targets have been discovered and logged in to, the **New Domain** window automatically displays targets with LUNs unused by the environment.

      **Note**

      LUNs used externally to the environment are also displayed.

      You can use the **Discover Targets** options to add LUNs on many targets, or multiple paths to the same LUNs.

   b. Enter the fully qualified domain name or IP address of the iSCSI host in the **Address** field.

   c. Enter the port to connect to the host on when browsing for targets in the **Port** field. The default is **3260**.

   d. If the Challenge Handshake Authentication Protocol (CHAP) is being used to secure the storage, select the **User Authentication** check box. Enter the **CHAP username** and **CHAP password**.

   e. Click the **Discover** button.

   f. Select the target you want to use from the discovery results and click the **Login** button.

      Alternatively, click the **Login All** to log in to all of the discovered targets.
8. Click the **+** button next to the desired target. This will expand the entry and display all unused LUNs attached to the target.
9. Select the check box for each LUN that you are using to create the storage domain.
10. Click **OK** to create the storage domain and close the window.

### Result

The new iSCSI storage domain displays on the storage tab. This can take up to 5 minutes.

Report a bug

## 12.3.4. Adding FCP Storage

### Summary

Red Hat Enterprise Virtualization platform supports SAN storage by creating a storage domain from a volume group made of pre-existing LUNs. Neither volume groups nor LUNs can be attached to more than one storage domain at a time.

Red Hat Enterprise Virtualization system administrators need a working knowledge of Storage Area Networks (SAN) concepts. SAN usually uses Fibre Channel Protocol (FCP) for traffic between hosts and shared external storage. For this reason, SAN may occasionally be referred to as FCP storage.

For information regarding the setup and configuration of FCP or multipathing on Red Hat Enterprise Linux, please refer to the *Storage Administration Guide* and *DM Multipath Guide*.

**Note**

You can only add an FCP storage domain to a data center that is set up for FCP storage type.

**Procedure 12.5. Adding FCP Storage**

1. Click the **Storage** resource tab to list all storage domains in the virtualized environment.
2. Click **New Domain** to open the **New Domain** window.
3. Enter the **Name** of the storage domain

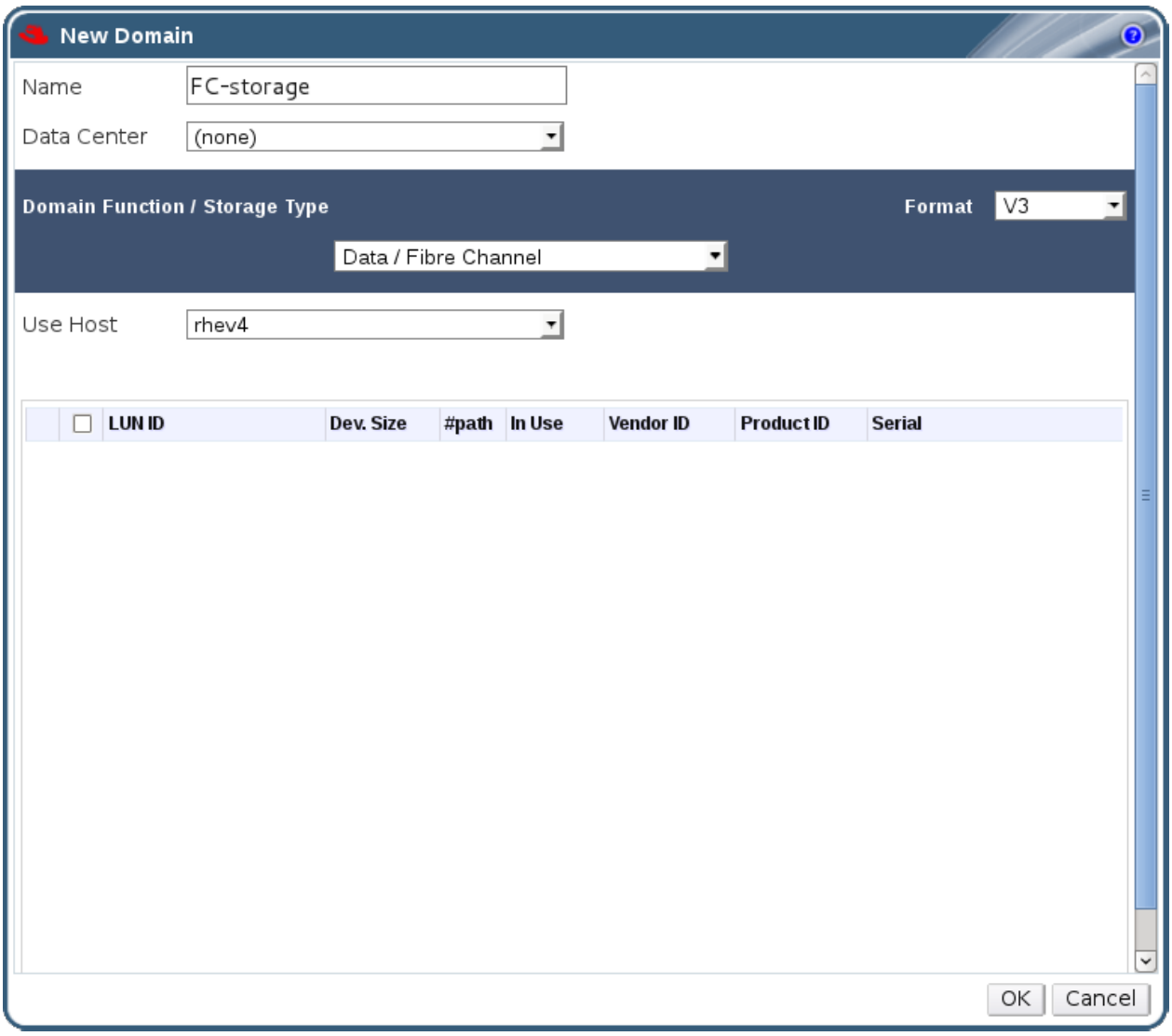


**Figure 12.3. Adding FCP Storage**

4. Use the **Data Center** drop-down menu to select an FCP data center.

   If you do not yet have an appropriate FCP data center, select **(none)**.
5. Use the drop-down menus to select the **Domain Function / Storage Type** and the **Format**. The storage domain types that are not compatible with the chosen data center are not available.
6. Select an active host in the **Use Host** field. If this is not the first data domain in a data center, you must select the data center's SPM host.

   **Important**

   All communication to the storage domain is via the selected host and not directly from the Red Hat Enterprise Virtualization Manager. At least one active host must exist in the system, and be attached to the chosen data center, before the storage is configured.
7. The **New Domain** window automatically displays known targets with unused LUNs when **Data / Fibre Channel** is selected as the storage type. Select the **LUN ID** check box to select all of the available LUNs.

Alternatively, select the **Add LUN** check boxes for individual LUNs to use them with the FCP data domain.

8. Click **OK** to create the storage domain and close the window.

#### Result

The new FCP data domain displays on the **Storage** tab. It will remain with a **Locked** status while it is being prepared for use. When ready, it is automatically attached to the data center. Select either **Build New Domain** or **Use Existing Volume Group**.

Report a bug

## 12.3.5. Adding Local Storage

### 12.3.5.1. Preparing Local Storage

#### Summary

A local storage domain can be set up on a host. When you set up host to use local storage, the host automatically gets added to a new data center and cluster that no other hosts can be added to. Multiple host clusters require that all hosts have access to all storage domains, which is not possible with local storage. Virtual machines created in a single host cluster cannot be migrated, fenced or scheduled.

**Important**

On Red Hat Enterprise Virtualization Hypervisors the only path permitted for use as local storage is **/data/images**. This directory already exists with the correct permissions on Hypervisor installations. The steps in this procedure are only required when preparing local storage on Red Hat Enterprise Linux virtualization hosts.

**Procedure 12.6. Preparing Local Storage**

1. On the virtualization host, create the directory to be used for the local storage.

```
# mkdir -p /data/images
```

2. Ensure that the directory has permissions allowing read/write access to the **vdsm** user (UID 36) and **kvm** group (GID 36).

```
# chown 36:36 /data /data/images
```

```
# chmod 0755 /data /data/images
```

#### Result

Your local storage is ready to be added to the Red Hat Enterprise Virtualization environment.

Report a bug

### 12.3.5.2. Adding Local Storage

#### Summary

You have prepared the storage that is local to your host. Add it to the host to begin using it.

Adding local storage to a host in this manner causes the host to be put in a new data center and cluster. The local storage configuration window combines the creation of a data center, a cluster, and storage into a single process.

**Procedure 12.7. Adding Local Storage**

1. Use the **Hosts** resource tab, tree mode, or the search function to find and select the host in the results list.
2. Click **Maintenance** to place the host into maintenance mode.
3. Click **Configure Local Storage** to open the **Configure Local Storage** window.

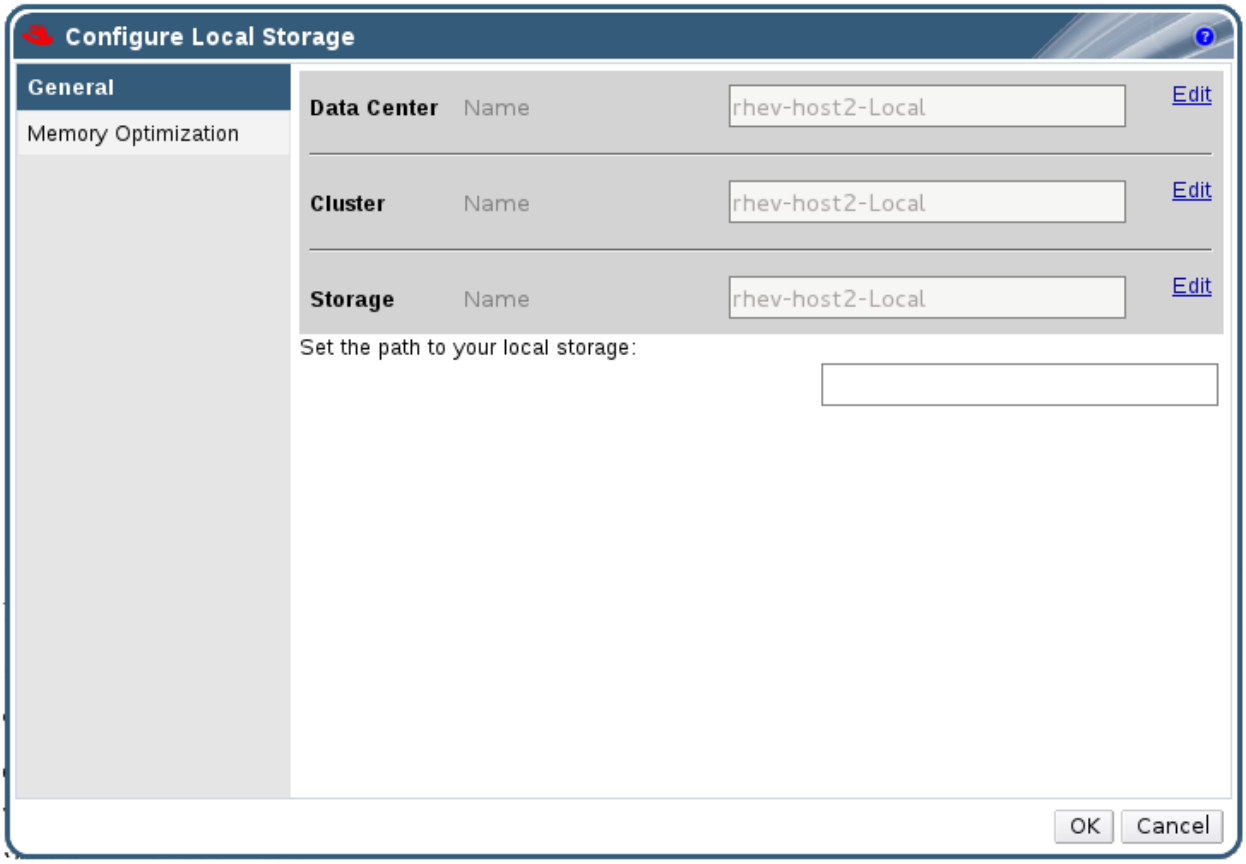


**Figure 12.4. Configure Local Storage Window**

4. Click the **Edit** buttons next to the **Data Center**, **Cluster**, and **Storage** fields to configure and name the local storage domain.
5. Set the path to your local storage in the text entry field.
6. If applicable, select the **Memory Optimization** tab to configure the memory optimization policy for the new local storage cluster.
7. Click **OK** to save the settings and close the window.

### Result

Your host comes online in a data center of its own.

Report a bug

## 12.3.6. Adding POSIX Compliant File System Storage

### 12.3.6.1. POSIX Compliant File System Storage in Red Hat Enterprise Virtualization

Red Hat Enterprise Virtualization 3.1 and higher supports the use of POSIX (native) file systems for storage. POSIX file system support allows you to mount file systems using the same mount options that you would normally use when mounting them manually from the command line. This functionality is intended to allow access to storage not exposed using NFS, iSCSI, or FCP.

Any POSIX compliant filesystem used as a storage domain in Red Hat Enterprise Virtualization **MUST** support sparse files and direct I/O. The Common Internet File System (CIFS), for example, does not support direct I/O, making it incompatible with Red Hat Enterprise Virtualization.

**Important**

Do *not* mount NFS storage by creating a POSIX compliant file system Storage Domain. Always create an NFS Storage Domain instead.

Report a bug

### 12.3.6.2. Attaching POSIX Compliant File System Storage

#### Summary

You want to use a POSIX compliant file system that is not exposed using NFS, iSCSI, or FCP as a storage domain.

**Procedure 12.8. Attaching POSIX Compliant File System Storage**

1. Click the **Storage** resource tab to list the existing storage domains in the results list.
2. Click **New Domain** to open the **New Domain** window.

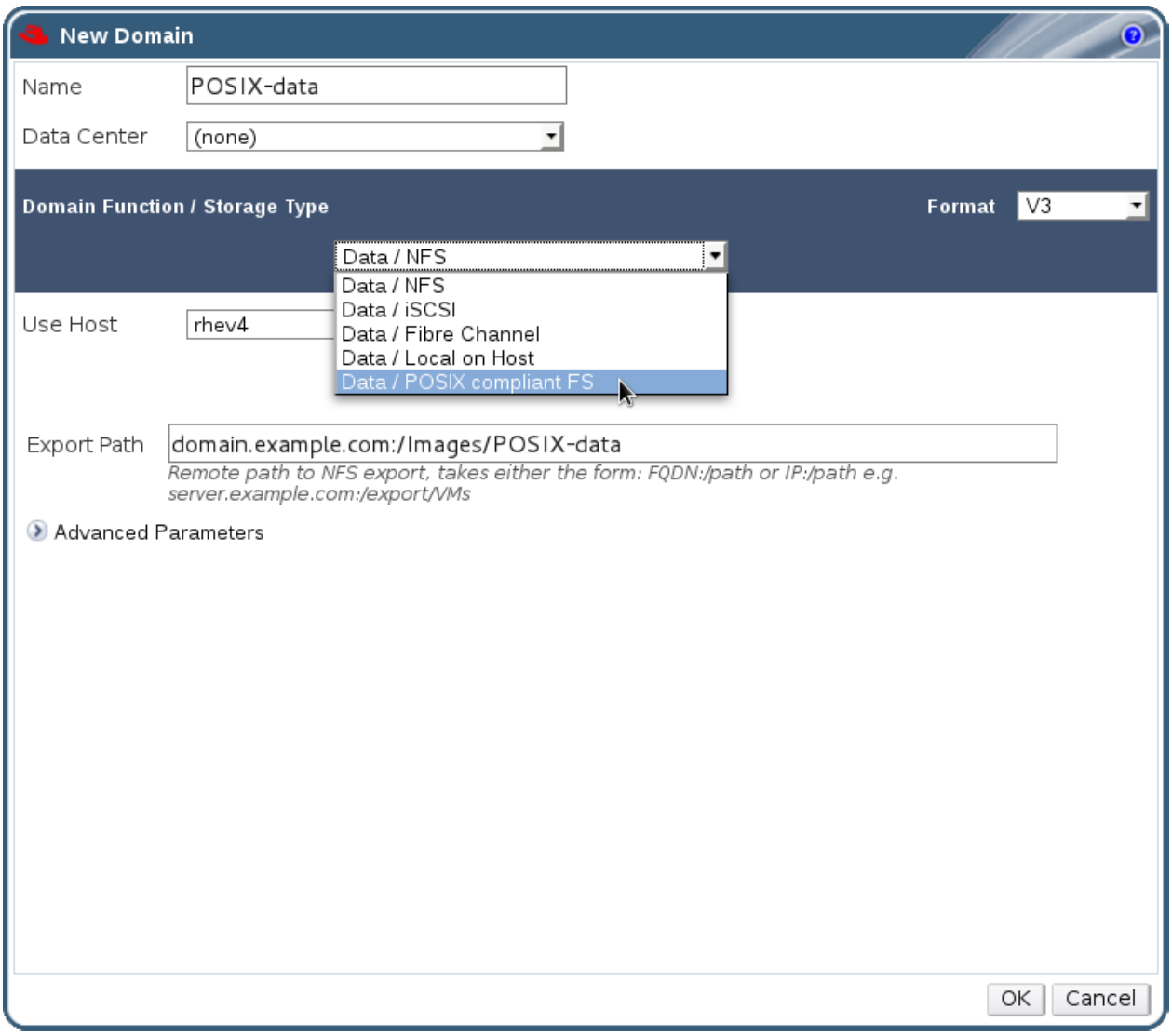


**Figure 12.5. POSIX Storage**

3. Enter the **Name** for the storage domain.
4. Select the **Data Center** to be associated with the storage domain. The Data Center selected must be of type **POSIX (POSIX compliant FS)**. Alternatively, select **(none)**.
5. Select **Data / POSIX compliant FS** from the **Domain Function / Storage Type** drop-down menu.

   If applicable, select the **Format** from the drop-down menu.
6. Select a host from the **Use Host** drop-down menu. Only hosts within the selected data center will be listed. The host that you select will be used to connect the storage domain.
7. Enter the **Path** to the POSIX file system, as you would normally provide it to the **mount** command.
8. Enter the **VFS Type**, as you would normally provide it to the **mount** command using the ***-t*** argument. See **man mount** for a list of valid VFS types.
9. Enter additional **Mount Options**, as you would normally provide them to the **mount** command using the ***-o*** argument. The mount options should be provided in a comma-separated list. See **man mount** for a list of valid mount options.
10. Click **OK** to attach the new Storage Domain and close the window.

### Result

You have used a supported mechanism to attach an unsupported file system as a storage domain.

Report a bug

# 12.4. Populating the ISO Domain

## 12.4.1. Populating the ISO Storage Domain

### Summary

An ISO storage domain is attached to a data center, ISO images must be uploaded to it. Red Hat Enterprise Virtualization provides an ISO uploader tool that ensures that the images are uploaded into the correct directory path, with the correct user permissions.

The creation of ISO images from physical media is not described in this document. It is assumed that you have access to the images required for your environment.

**Procedure 12.9. Populating the ISO Storage Domain**

1. Copy the required ISO image to a temporary directory on the system running Red Hat Enterprise Virtualization Manager.
2. Log in to the system running Red Hat Enterprise Virtualization Manager as the **root** user.
3. Use the **rhevm-iso-uploader** command to upload the ISO image. This action will take some time, the amount of time varies depending on the size of the image being uploaded and available network bandwidth.

   **Example 12.1. ISO Uploader Usage**

   In this example the ISO image **RHEL6.iso** is uploaded to the ISO domain called **ISODomain** using NFS. The command will prompt for an administrative username and password. The username must be provided in the form ***username*@*domain***.

   ```
   # rhevm-iso-uploader --iso-domain=ISODomain upload RHEL6.iso
   ```

### Result

The ISO image is uploaded and appears in the ISO storage domain specified. It is also available in the list of available boot media when creating virtual machines in the data center which the storage domain is attached to.

**See Also:**

- Section 12.4.2, “VirtIO and Guest Tool Image Files”
- Section 12.4.3, “Uploading the VirtIO and Guest Tool Image Files to an ISO Storage Domain”

Report a bug

## 12.4.2. VirtIO and Guest Tool Image Files

The *virtio-win* ISO and Virtual Floppy Drive (VFD) images, which contain the VirtIO drivers for Windows virtual machines, and the *rhev-tools-setup* ISO, which contains the Red Hat Enterprise Virtualization Guest Tools for Windows virtual machines, are copied to an ISO storage domain upon installation and configuration of the domain.

These image files provide software that can be installed on virtual machines to improve performance and usability. The most recent *virtio-win* and *rhev-tools-setup* images are referred to by the following symbolic links on the file system of the Red Hat Enterprise Virtualization Manager:

- **/usr/share/virtio-win/virtio-win.iso**
- **/usr/share/virtio-win/virtio-win.vfd**
- **/usr/share/rhev-guest-tools-iso/rhev-tools-setup.iso**

These image files must be manually uploaded to ISO storage domains that were not created locally by the installation process. Use the **rhevm-iso-uploader** command to upload these images to your ISO storage domain. Once uploaded, the image files can be attached to and used by virtual machines.

**See Also:**

- Section 12.4.3, “Uploading the VirtIO and Guest Tool Image Files to an ISO Storage Domain”

Report a bug

### 12.4.3. Uploading the VirtIO and Guest Tool Image Files to an ISO Storage Domain

The example below demonstrates the command to upload the **virtio-win.iso**, **virtio-win.vfd**, and **rhev-tools-setup.iso** image files to the **ISODomain**.

**Example 12.2. Uploading the VirtIO and Guest Tool Image Files**

```
# rhevm-iso-uploader --iso-domain=ISODomain upload /usr/share/virtio-win/virtio-win.iso /usr/share/virtio-win/virtio-win.vfd /usr/share/rhev-guest-tools-iso/rhev-tools-setup.iso
```

**See Also:**

- Section 12.4.2, “VirtIO and Guest Tool Image Files”

Report a bug

# Log Files

## A.1. Red Hat Enterprise Virtualization Manager Installation Log Files

**Table A.1. Installation**

| Log File | Description |
|---|---|
| **/var/log/ovirt-engine/engine-cleanup_*yyyy_mm_dd_hh_mm_ss*.log** | Log from the **engine-cleanup** command. This is the command used to reset a Red Hat Enterprise Virtualization Manager installation. A log is generated each time the command is run. The date and time of the run is used in the filename to allow multiple logs to exist. |
| **/var/log/ovirt-engine/engine-db-install-*yyyy_mm_dd_hh_mm_ss*.log** | Log from the **rhevm-setup** command detailing the creation and configuration of the **rhevm** database. |
| **/var/log/ovirt-engine/rhevm-dwh-setup-*yyyy_mm_dd_hh_mm_ss*.log** | Log from the **rhevm-dwh-setup** command. This is the command used to create the **rhevm_history** database for reporting. A log is generated each time the command is run. The date and time of the run is used in the filename to allow multiple logs to exist concurrently. |
| **/var/log/ovirt-engine/ovirt-engine-reports-setup-*yyyy_mm_dd_hh_mm_ss*.log** | Log from the **rhevm-reports-setup** command. This is the command used to install the Red Hat Enterprise Virtualization Manager Reports modules. A log is generated each time the command is run. The date and time of the run is used in the filename to allow multiple logs to exist concurrently. |
| **/var/log/ovirt-engine/engine-setup_*yyyy_mm_dd_hh_mm_ss*.log** | Log from the **rhevm-setup** command. A log is generated each time the command is run. The date and time of the run is used in the filename to allow multiple logs to exist concurrently. |
| **/var/log/ovirt-engine/ovirt-engine-upgrade_*yyyy_mm_dd_hh_mm_ss*.log** | Log from the **rhevm-upgrade** command. A log is generated each time the command is run. The date and time of the run is used in the filename to allow multiple logs to exist concurrently. |

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## A.2. Red Hat Enterprise Virtualization Manager Log Files

**Table A.2. Service Activity**

| Log File | Description |
|---|---|
| **/var/log/ovirt-engine/engine.log** | Reflects all Red Hat Enterprise Virtualization Manager GUI crashes, Active Directory look-ups, Database issues, and other events. |
| **/var/log/ovirt-engine/host-deploy** | Log files from hosts deployed from the Red Hat Enterprise Virtualization Manager. |

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## A.3. Red Hat Enterprise Virtualization Host Log Files

**Table A.3. Installation**

| Log File | Description |
|---|---|
| **/var/log/vdsm/libvirt.log** | Log file for **libvirt**. |
| **/var/log/vdsm/spm-lock.log** | Log file detailing the host's ability to obtain a lease on the Storage Pool Manager role. The log details when the host has acquired, released, renewed, or failed to renew the lease. |
| **/var/log/vdsm/vdsm.log** | Log file for VDSM, the Manager's agent on the virtualization host(s). |
| **/tmp/ovirt-host-deploy-*@DATE@*.log** | Host deployment log, copied to engine as /var/log/ovirt-engine/host-deploy/ovirt-***@DATE@-@HOST@-@CORRELATION_ID@***.log after the host has been successfully deployed. |

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## A.4. Remotely Logging Host Activities

### A.4.1. Setting up a Virtualization Host Logging Server

#### Summary

Red Hat Enterprise Virtualization hosts generate and update log files, recording their actions and problems. Collecting these log files centrally simplifies debugging.

This procedure should be used on your centralized log server. You could use a separate logging server, or use this procedure to enable host logging on the Red Hat Enterprise Virtualization Manager.

**Procedure A.1. Setting up a Virtualization Host Logging Server**

1. Configure SELinux to allow **rsyslog** traffic.

```
# semanage port -a -t syslogd_port_t -p udp 514
```

2. Edit **/etc/rsyslog.conf** and add below lines:

```
$template TmplAuth, "/var/log/%fromhost%/secure"
$template TmplMsg, "/var/log/%fromhost%/messages"

authpriv.*   ?TmplAuth
*.info,mail.none;authpriv.none,cron.none   ?TmplMsg
```

Un-comment the following:

```
#$ModLoad imudp
#$UDPServerRun 514
```

3. Restart the rsyslog service:

```
# service rsyslog restart
```

**Result**

Your centralized log server is now configured to receive and store the **messages** and **secure** logs from your virtualization hosts.

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## A.4.2. Configuring Red Hat Enterprise Virtualization Hypervisor Hosts to Use a Logging Server

**Prerequisites:**

- Section A.4.1, “Setting up a Virtualization Host Logging Server”

**Summary**

Red Hat Enterprise Virtualization hosts generate and update log files, recording their actions and problems. Collecting these log files centrally simplifies debugging.

Use this procedure on a Red Hat Enterprise Virtualization Hypervisor host to begin sending log files to your centralized log server.

**Procedure A.2. Configuring Red Hat Enterprise Virtualization Hypervisor Hosts to Use a Logging Server**

1. Log in to your Red Hat Enterprise Virtualization Hypervisor host as **admin** to access the Hypervisors text user interface (TUI) setup screen.
2. Select **Logging** from the list of options on the left of the screen.
3. Press the **Tab** key to reach the text entry fields. Enter the IP address or FQDN of your centralized log server and the port it uses.
4. Press the **Tab** key to reach the **Apply**, and press the **Enter** Key.

**Result**

Your Red Hat Enterprise Virtualization Hypervisor host has been configured to send messages to a centralized log server.

Report a bug

## A.4.3. Configuring Red Hat Enterprise Linux Hosts to Use a Logging Server

**Prerequisites:**

- Section A.4.1, “Setting up a Virtualization Host Logging Server”

### Summary

Red Hat Enterprise Virtualization hosts generate and update log files, recording their actions and problems. Collecting these log files centrally simplifies debugging.

Use this procedure on your Red Hat Enterprise Linux host to configure it to send logs to your centralized log server.

**Procedure A.3. Configuring Red Hat Enterprise Linux Hosts to Use a Logging Server**

1. Ensure that you have **rsyslog** installed:

   ```
   # rpm -qi rsyslog
   ```

   If **rsyslog** is not installed, install it:

   ```
   # yum install rsyslog
   ```

2. Edit **/etc/rsyslog.conf**, and specify the address of your centralized log server by adding the following:

   ```
   authpriv.*;*.info,mail.none,cron.none    @YOURSERVERADDRESS:YOURSERVERPORT
   ```

   For example:

   ```
   authpriv.*;*.info,mail.none,cron.none    @192.168.20.254:514
   ```

   Or:

   ```
   authpriv.*;*.info,mail.none,cron.none    @log-server.company.com:514
   ```

   The single @ specifies the UDP protocol for transmission. Use a double @@ to specify the TCP protocol for transmission.

3. Restart the **rsyslog** service:

   ```
   # service rsyslog restart
   ```

### Result

Your Red Hat Enterprise Linux host now sends log messages to your centralized log server.

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# Additional Utilities

## B.1. Domain Management Tool

### B.1.1. What is the Domain Management Tool?

Red Hat Enterprise Virtualization Manager authenticates users using directory services. To add users to Red Hat Enterprise Virtualization Manager you must first use the internal **admin** user to add the directory service that the users must be authenticated against. You add and remove directory services domains using the included domain management tool, **rhevm-manage-domains**.

The **rhevm-manage-domains** command is only accessible on the machine on which Red Hat Enterprise Virtualization Manager is installed. The **rhevm-manage-domains** command must be run as the **root** user.

**See Also:**

- Section B.1.2, “Syntax for the Domain Management Tool”
- Section B.1.3, “Adding Domains to Configuration”
- Section B.1.4, “Editing a Domain in the Configuration”
- Section B.1.5, “Deleting a Domain from the Configuration”
- Section B.1.6, “Validating Domain Configuration”
- Section B.1.7, “Listing Domains in Configuration”

Report a bug

### B.1.2. Syntax for the Domain Management Tool

The usage syntax is:

```
rhevm-manage-domains -action=ACTION [options]
```

Available actions are:

***add***

Add a domain to Red Hat Enterprise Virtualization Manager's directory services configuration.

***edit***

Edit a domain in Red Hat Enterprise Virtualization Manager's directory services configuration.

***delete***

Delete a domain from Red Hat Enterprise Virtualization Manager's directory services configuration.

***validate***

Validate Red Hat Enterprise Virtualization Manager's directory services configuration. This command attempts to authenticate each domain in the configuration using the configured user name and password.

***list***

List Red Hat Enterprise Virtualization Manager's current directory services configuration.

These options can be combined with the actions on the command line:

***-domain=DOMAIN***

Specifies the domain on which the action will be performed. The ***-domain*** parameter is mandatory for ***add***, ***edit***, and ***delete***.

***-provider*=PROVIDER**

Specifies the LDAP provider type of the directory server for the domain. Valid values are:

- ***ActiveDirectory*** - Active Directory.
- ***IPA*** - Identity Management (IdM).
- ***RHDS*** - Red Hat Directory Server. Red Hat Directory Server does not come with Kerberos. Red Hat Enterprise Virtualization requires Kerberos authentication. RHDS must be made a service within a Kerberos domain to provide directory services to the Manager.

**Note**

If you want to use RHDS as your directory server, you must have the **memberof** plugin installed in RHDS. To use the **memberof** plugin, your users must be **inetuser**s. For more information about using the **memberof** plugin, see the *Red Hat Directory Server Plug-in Guide*.

***-user=USER***

Specifies the domain user to use. The ***-user*** parameter is mandatory for ***add***, and optional for ***edit***.

***-passwordFile=FILE***

Specifies that the domain user's password is on the first line of the provided file. This option, or the ***-interactive*** option, must be used to provide the password for use with the ***add*** action.

***-addPermissions***

Specifies that the domain user will be given the **SuperUser** role in Red Hat Enterprise Virtualization Manager. By default, if the ***-addPermissions*** parameter is not specified, the **SuperUser** role is not assigned to the domain user. The ***-addPermissions*** option is optional. It is only valid when used in combination with the ***add*** and ***edit*** actions.

***-interactive***

Specifies that the domain user's password is to be provided interactively. This option, or the ***-passwordFile*** option, must be used to provide the password for use with the ***add*** action.

***-configFile=FILE***

Specifies an alternate configuration file that the command must load. The ***-configFile*** parameter is always optional.

***-report***

In conjunction with the ***validate*** action results in the output of a report of all encountered validation errors.

For full usage information consult the **rhevm-manage-domains** command's help output:

```
# rhevm-manage-domains --help
```

**See Also:**

- Section B.1.1, “What is the Domain Management Tool?”
- Section B.1.3, “Adding Domains to Configuration”
- Section B.1.4, “Editing a Domain in the Configuration”
- Section B.1.5, “Deleting a Domain from the Configuration”
- Section B.1.6, “Validating Domain Configuration”
- Section B.1.7, “Listing Domains in Configuration”

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## B.1.3. Adding Domains to Configuration

In this example, the **rhevm-manage-domains** command is used to add the **IdM** domain **directory.demo.redhat.com** to the Red Hat Enterprise Virtualization Manager configuration. The configuration is set to use the **admin** user when querying the domain; the password is provided interactively.

**Example B.1. rhevm-manage-domains Add Action**

```
# rhevm-manage-domains -action=add -domain=directory.demo.redhat.com -
provider=IPA -user=admin -interactive
loaded template kr5.conf file
setting default_tkt_enctypes
setting realms
setting domain realm
success
User guid is: 80b71bae-98a1-11e0-8f20-525400866c73
Successfully added domain directory.demo.redhat.com. oVirt Engine restart is
required in order for the changes to take place (service ovirt-engine restart).
```

**See Also:**

- Section B.1.1, “What is the Domain Management Tool?”
- Section B.1.2, “Syntax for the Domain Management Tool”
- Section B.1.4, “Editing a Domain in the Configuration”
- Section B.1.5, “Deleting a Domain from the Configuration”
- Section B.1.6, “Validating Domain Configuration”

- Section B.1.7, “Listing Domains in Configuration”

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### B.1.4. Editing a Domain in the Configuration

In this example, the **rhevm-manage-domains** command is used to edit the **directory.demo.redhat.com** domain in the Red Hat Enterprise Virtualization Manager configuration. The configuration is updated to use the **admin** user when querying this domain; the password is provided interactively.

**Example B.2. rhevm-manage-domains Edit Action**

```
# rhevm-manage-domains -action=edit -domain=directory.demo.redhat.com -
user=admin -interactive
loaded template kr5.conf file
setting default_tkt_enctypes
setting realms
setting domain realmo
success
User guide is: 80b71bae-98a1-11e0-8f20-525400866c73
Successfully edited domain directory.demo.redhat.com. oVirt Engine restart is
required in order for the changes to take place (service ovirt-engine restart).
```

**See Also:**

- Section B.1.1, “What is the Domain Management Tool?”
- Section B.1.2, “Syntax for the Domain Management Tool”
- Section B.1.3, “Adding Domains to Configuration”
- Section B.1.5, “Deleting a Domain from the Configuration”
- Section B.1.6, “Validating Domain Configuration”
- Section B.1.7, “Listing Domains in Configuration”

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### B.1.5. Deleting a Domain from the Configuration

In this example, the **rhevm-manage-domains** command is used to remove the **directory.demo.redhat.com** domain from the Red Hat Enterprise Virtualization Manager configuration. Users defined in the removed domain will no longer be able to authenticate with the Red Hat Enterprise Virtualization Manager. The entries for the affected users will remain defined in the Red Hat Enterprise Virtualization Manager until they are explicitly removed.

The domain being removed in this example is the last one listed in the Red Hat Enterprise Virtualization Manager configuration. A warning is displayed highlighting this fact and that only the **admin** user from the **internal** domain will be able to log in until another domain is added.

**Example B.3. `rhevm-manage-domains` Delete Action**

```
# rhevm-manage-domains -action=delete -domain='directory.demo.redhat.com'
WARNING: Domain directory.demo.redhat.com is the last domain in the
configuration. After deleting it you will have to either add another domain, or
to use the internal admin user in order to login.
Successfully deleted domain directory.demo.redhat.com. Please remove all users
and groups of this domain using the Administration portal or the API.
```

**See Also:**

- Section B.1.1, “What is the Domain Management Tool?”
- Section B.1.2, “Syntax for the Domain Management Tool”
- Section B.1.3, “Adding Domains to Configuration”
- Section B.1.4, “Editing a Domain in the Configuration”
- Section B.1.6, “Validating Domain Configuration”
- Section B.1.7, “Listing Domains in Configuration”

Report a bug

## B.1.6. Validating Domain Configuration

In this example, the **`rhevm-manage-domains`** command is used to validate the Red Hat Enterprise Virtualization Manager configuration. The command attempts to log into each listed domain with the credentials provided in the configuration. The domain is reported as valid if the attempt is successful.

**Example B.4. `rhevm-manage-domains` Validate Action**

```
# rhevm-manage-domains -action=validate
User guide is: 80b71bae-98a1-11e0-8f20-525400866c73
Domain directory.demo.redhat.com is valid.
```

**See Also:**

- Section B.1.1, “What is the Domain Management Tool?”
- Section B.1.2, “Syntax for the Domain Management Tool”
- Section B.1.3, “Adding Domains to Configuration”
- Section B.1.4, “Editing a Domain in the Configuration”
- Section B.1.5, “Deleting a Domain from the Configuration”
- Section B.1.7, “Listing Domains in Configuration”

Report a bug

## B.1.7. Listing Domains in Configuration

In this example, the **`rhevm-manage-domains`** command is used to list the domains defined in the Red Hat Enterprise Virtualization Manager configuration. For each configuration entry the command displays the domain, the user name — in User Principle Name (UPN) format — and whether the domain is local or remote.

**Example B.5. `rhevm-manage-domains` List Action**

```
# rhevm-manage-domains -action=list
Domain: directory.demo.redhat.com
    User name: admin@DIRECTORY.DEMO.REDHAT.COM
    This domain is a remote domain.
```

**See Also:**

- Section B.1.1, “What is the Domain Management Tool?”
- Section B.1.2, “Syntax for the Domain Management Tool”
- Section B.1.3, “Adding Domains to Configuration”
- Section B.1.4, “Editing a Domain in the Configuration”
- Section B.1.5, “Deleting a Domain from the Configuration”
- Section B.1.6, “Validating Domain Configuration”

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# B.2. Configuration Tool

## B.2.1. Configuration Tool

Installing the Red Hat Enterprise Virtualization Manager modifies only a subset of configuration settings from their defaults. Further modifications are made using the configuration tool: **`rhevm-config`**.

The configuration tool does not require JBoss or the Red Hat Enterprise Virtualization Manager to be running to update the configuration. Configuration key values are stored in the database; configuration changes will not be saved unless the database is operational. Changes are applied when JBoss is restarted.

The Red Hat Enterprise Virtualization Manager stores configuration settings as a series of key-to-value pair mappings. The configuration tool allows you to:

- list all available configuration keys,
- list all available configuration values,
- retrieve the value of a specific configuration key, and
- set the value of a specific configuration key.

You are also able to maintain multiple versions of the Manager's configuration with the configuration tool. Use the ***`--cver`*** parameter to specify the configuration version to be used when retrieving or setting a value for a configuration key. The default configuration version is **`general`**.

**See Also:**

- Section B.2.2, “Syntax for rhevm-config Command”

Report a bug

## B.2.2. Syntax for rhevm-config Command

The configuration tool is accessible on the client machine on which the Red Hat Enterprise Virtualization Manager is installed. For full usage information consult the help output of the **`rhevm-config`** command:

```
# rhevm-config --help
```

**Common tasks**

**List available configuration keys**

Use the ***--list*** parameter to list available configuration keys.

```
# rhevm-config --list
```

Each available configuration key is listed by name and description.

**List available configuration values**

Use the ***--all*** parameter to list available configuration values.

```
# rhevm-config --all
```

Each available configuration key is listed by name, current value of the key, and the configuration version.

**Retrieve value of configuration key**

Use the ***--get*** parameter to retrieve the value of a specific key.

```
# rhevm-config --get KEY_NAME
```

Replace ***KEY_NAME*** with the name of the specific key to retrieve the key name, value, and the configuration version. Use the ***--cver*** parameter to specify the configuration version of the value to be retrieved.

**Set value of configuration key**

Use the ***--set*** parameter to set the value of a specific key. You must also set the configuration version to which the change is to apply using the ***--cver*** parameter.

```
# rhevm-config --set KEY_NAME=KEY_VALUE --cver=VERSION
```

Replace ***KEY_NAME*** with the name of the specific key to set; replace ***KEY_VALUE*** with the value to be set. Environments with more than one configuration version require the ***VERSION*** to be specified.

**See Also:**

- Section B.2.1, “Configuration Tool”

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# B.3. Image Uploader

## B.3.1. Virtual Machine Image Uploader

Using the rhevm-image-uploader command, you can list export storage domains and upload virtual machines in Open Virtualization Format (OVF) to an export storage domain and have them automatically recognized in the Red Hat Enterprise Virtualization Manager. The tool only supports gzip compressed OVF files created by Red Hat Enterprise Virtualization.

The image uploader makes creating distributable virtual machine images practical.

The archive should contain images and master directories that are in the following format:

```
|-- images
|   |-- [Image Group UUID]
|        |--- [Image UUID (this is the disk image)]
|        |--- [Image UUID (this is the disk image)].meta
|-- master
|   |---vms
|       |--- [UUID]
|             |--- [UUID].ovf
```

**See Also:**

- Section B.3.2, “Syntax for the rhevm-image-uploader Command”
- Section B.3.3, “Creating an OVF Archive That Is Compatible with the Image Uploader”
- Section B.3.4, “Basic rhevm-image-uploader Usage Examples”

Report a bug

## B.3.2. Syntax for the rhevm-image-uploader Command

The basic syntax for the image uploader command is:

```
rhevm-image-uploader [options] list
rhevm-image-uploader [options] upload [file].[file]...[file]
```

The two supported modes of operation are ***list*** and ***upload***.

- The ***list*** parameter lists the valid export storage domains available for image uploads.
- The ***upload*** parameter uploads selected image file(s) to the specified image storage domain.

The image uploader command requires either the ***list*** or ***upload*** parameter be included for basic usage. The ***upload*** parameter requires a minimum of one local file name to upload.

There are numerous parameters to further refine the **rhevm-image-uploader** command. You can set defaults for any of these in the **/etc/ovirt-engine/imageuploader.conf** file.

**General Options**

***-h*, *--help***

Displays command usage information and returns to prompt.

***--conf-file=PATH***

Sets ***PATH*** as the configuration file the tool is to use. The default is **etc/ovirt-engine/imageuploader.conf**.

***--log-file=PATH***

Sets ***PATH*** as the specific file name the command should use for the log output.

***--quiet***

Sets quiet mode, reducing console output to a minimum. Quiet mode is off by default.

***-v*, *--verbose***

Sets verbose mode, providing more console output. Verbose mode is off by default.

***-f*, *--force***

Force mode is necessary when the source file being uploaded has an identical file name as an existing file at the destination; it forces the existing file to be overwritten. Force mode is off by default.

### Red Hat Enterprise Virtualization Manager Options

***-u USER*, *--user=USER***

Sets the user associated with the file to be uploaded. The ***USER*** is specified in the format ***user*@*domain***, where ***user*** is the user name and ***domain*** is the directory services domain in use. The user must exist in directory services and be known to the Red Hat Enterprise Virtualization Manager.

***-r FQDN*, *--rhevm=FQDN***

Sets the fully qualified domain name of the Red Hat Enterprise Virtualization Manager server from which to upload images, where ***FQDN*** is replaced by the fully qualified domain name of the Manager. It is assumed that the image uploader is being run on the same client machine as the Red Hat Enterprise Virtualization Manager; the default value is **`localhost:443`**.

### Export Storage Domain Options

These options specify the export domain to which files are uploaded. They are alternatives; do not use these parameters together.

***-e*, *--export-domain=EXPORT_DOMAIN***

Sets the storage domain ***EXPORT_DOMAIN*** as the destination for uploads.

***-n*, *--nfs-server=NFSSERVER***

Sets the NFS path ***NFSSERVER*** as the destination for uploads.

***-i*, *--ovf-id***

Use this option if you do not want to update the UUID of the image. By default, the tool will generate a new UUID for the image. This ensures that there is no conflict between the id of the incoming image and those already in the environment.

***-d*, *-disk-instance-id***

Use this option if you do not want to rename the instance ID for each disk (i.e. InstanceId) in the image. By default, this tool will generate new UUIDs for disks within the image to be imported. This ensures that there are no conflicts between the disks on the imported image and those within the environment.

***-m*, *--mac-address***

Use this option if you do not want to remove the network components from the image that will be imported. By default, this tool will remove any network interface cards from the image to prevent conflicts with network cards on other virtual machines within the environment. Once the image has been imported, use the Administration Portal to add network interface cards back and the Manager will ensure that there are no MAC address conflicts.

***-N NEW_IMAGE_NAME*, *--name=NEW_IMAGE_NAME***

Supply this option if you want to rename the image.

**See Also:**

- Section B.3.1, “Virtual Machine Image Uploader”
- Section B.3.3, “Creating an OVF Archive That Is Compatible with the Image Uploader”
- Section B.3.4, “Basic rhevm-image-uploader Usage Examples”

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## B.3.3. Creating an OVF Archive That Is Compatible with the Image Uploader

### Summary

You can create files that can be uploaded using the **`rhevm-image-uploader`** tool.

**Procedure B.1. Creating an OVF Archive That is Compatible with the Image Uploader**

1. Use the Manager to create an empty export domain. An empty export domain makes it easy to see which directory contains your virtual machine.
2. Export your virtual machine to the empty export domain you just created.
3. Log in to the storage server that serves as the export domain, find the root of the NFS share and change to the subdirectory under that mount point. You started with a new export domain, there is only one directory under the exported directory. It contains the **`images/`** and **`master/`** directories.
4. Run the **`tar -zcvf my.ovf images/ master/`** command to create the tar/gzip ovf archive.
5. Anyone you give the resulting ovf file to (in this example, called **`my.ovf`**) can import it to Red Hat Enterprise Virtualization Manager using the **`rhevm-image-uploader`** command.

### Result

You have created a compressed OVF image file that can be distributed. Anyone you give it to can use the **`rhevm-image-uploader`** command to upload your image into their Red Hat Enterprise Virtualization environment.

**See Also:**

- Section B.3.1, “Virtual Machine Image Uploader”

- Section B.3.2, “Syntax for the rhevm-image-uploader Command”
- Section B.3.4, “Basic rhevm-image-uploader Usage Examples”

Report a bug

### B.3.4. Basic rhevm-image-uploader Usage Examples

Here is an example of how to use **rhevm-image-uploader** to list storage domains:

**Example B.6. Uploading a file Using the rhevm-image-uploader Tool**

```
# rhevm-image-uploader list
Please provide the REST API username for RHEV-M: admin@internal
Please provide the REST API password for the admin@internal RHEV-M user:
**********
Export Storage Domain Name | Datacenter  | Export Domain Status
myexportdom                | Myowndc     | active
```

To upload an Open Virtualization Format (ovf) file, you need to enter an NFS server name (**-n *NFSSERVER***) or export domain (**-e *EXPORT_STORAGE_DOMAIN***) and the name of the **.ovf** file:

```
# rhevm-image-uploader -e myexportdom upload myrhel6.ovf
Please provide the REST API username for RHEV-M: admin@internal
Please provide the REST API password for the admin@internal RHEV-M user:
**********
```

**See Also:**

- Section B.3.1, “Virtual Machine Image Uploader”
- Section B.3.2, “Syntax for the rhevm-image-uploader Command”
- Section B.3.3, “Creating an OVF Archive That Is Compatible with the Image Uploader”

Report a bug

## B.4. ISO Uploader

### B.4.1. ISO Uploader

The ISO uploader is a tool for uploading ISO images to the ISO storage domain. It is installed as part of the Red Hat Enterprise Virtualization Manager.

The ISO uploader command is **rhevm-iso-uploader**. You are required to log in as the **root** user and provide the administration credentials for the Red Hat Enterprise Virtualization environment. The **rhevm-iso-uploader *-h*** command displays usage information, including a list of all valid options for the **rhevm-iso-uploader** command.

**See Also:**

- Section B.4.2, “Syntax for rhevm-iso-uploader Command”
- Section B.4.3.1, “Specifying an NFS Server”
- Section B.4.3.2, “Basic ISO Uploader Usage”

Report a bug

### B.4.2. Syntax for rhevm-iso-uploader Command

The basic syntax for the ISO uploader command is:

```
rhevm-iso-uploader [options] list
rhevm-iso-uploader [options] upload [file].[file]...[file]
```

The two supported modes of operation are ***list*** and ***upload***.

- The ***list*** parameter lists the valid ISO storage domains available for ISO uploads. The Red Hat Enterprise Virtualization Manager sets this list on the local machine upon installation.
- The ***upload*** parameter uploads single or multiple space-separated ISO files to the specified ISO storage domain. NFS is used as default; SSH is available.

The ISO uploader command requires either the ***list*** or ***upload*** parameter be included for basic usage. The ***upload*** parameter requires a minimum of one local file name to upload.

There are numerous parameters to further refine the **rhevm-iso-uploader** command.

#### General Options

***--version***

Displays the version number of the command in use and returns to prompt.

***-h*, *--help***

Displays command usage information and returns to prompt.

***--conf-file=PATH***

Sets ***PATH*** as the configuration file the tool is to use.

***--log-file=PATH***

Sets ***PATH*** as the specific file name the command should use for the log output.

***--quiet***

Sets quiet mode, reducing console output to a minimum. Quiet mode is off by default.

***-v*, *--verbose***

Sets verbose mode, providing more console output. Verbose mode is off by default.

***-f*, *--force***

Force mode is necessary when the source file being uploaded has an identical file name as an existing file at the destination; it forces the existing file to be overwritten. Force mode is off by default.

#### Red Hat Enterprise Virtualization Manager Options

***-u USER*, *--user=USER***

Sets the user associated with the file to be uploaded. The ***USER*** is specified in the format ***user@domain***, where ***user*** is the user name and ***domain*** is the directory services domain in use. The user must exist in directory services and be known to the Red Hat Enterprise Virtualization Manager.

***-r FQDN*, *--rhevm=FQDN***

Sets the fully qualified domain name of the Red Hat Enterprise Virtualization Manager server from which to upload ISOs, where ***FQDN*** is replaced by the fully qualified domain name of the Manager. It is assumed that the ISO uploader is being run on the same client machine as the Red Hat Enterprise Virtualization Manager; the default value is **`localhost`**.

### ISO Storage Domain Options

These options specify the ISO domain to which files are uploaded. They are alternatives; do not use these parameters together.

***-i*, *--iso-domain=ISODOMAIN***

Sets the storage domain ***ISODOMAIN*** as the destination for uploads.

***-n*, *--nfs-server=NFSSERVER***

Sets the NFS path ***NFSSERVER*** as the destination for uploads.

### Connection Options

The ISO uploader uses NFS as default to upload files. These options specify SSH file transfer instead.

***--ssh-user=USER***

Sets ***USER*** as the SSH user name to use for the upload.

***--ssh-port=PORT***

Sets ***PORT*** as the port to use when connecting to SSH.

***-k KEYFILE*, *--key-file=KEYFILE***

Sets ***KEYFILE*** as the public key to use for SSH authentication. You will be prompted to enter the password of the user specified with ***--ssh-user=USER*** if no key is set.

### See Also:

- Section B.4.1, “ISO Uploader”
- Section B.4.3.1, “Specifying an NFS Server”
- Section B.4.3.2, “Basic ISO Uploader Usage”

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### B.4.3. Usage Examples

#### B.4.3.1. Specifying an NFS Server

**Example B.7. Uploading to an NFS Server**

```
# rhevm-iso-uploader --nfs-server=storage.demo.redhat.com:/iso/path upload
RHEL6.0.iso
```

**See Also:**

- Section B.4.1, “ISO Uploader”
- Section B.4.2, “Syntax for rhevm-iso-uploader Command”
- Section B.4.3.2, “Basic ISO Uploader Usage”

Report a bug

#### B.4.3.2. Basic ISO Uploader Usage

The example below demonstrates the ISO uploader and the list parameter. The first command lists the available ISO storage domains; the user name is requested because it was not provided in the command. The second command uploads an ISO file over NFS to the listed ISO domain: **ISODomain**.

**Example B.8. List Domains and Upload Image**

```
# rhevm-iso-uploader list
Please provide the REST API username for RHEV-M (CTRL+D to abort):
admin@directory.demo.redhat.com
Please provide the REST API password for RHEV-M (CTRL+D to abort):
ISO Storage Domain List:
  ISODomain
# rhevm-iso-uploader --iso-domain=ISODomain upload RHEL6.iso
Please provide the REST API username for RHEV-M (CTRL+D to abort):
admin@directory.demo.redhat.com
Please provide the REST API password for RHEV-M (CTRL+D to abort):
```

**See Also:**

- Section B.4.1, “ISO Uploader”
- Section B.4.2, “Syntax for rhevm-iso-uploader Command”
- Section B.4.3.1, “Specifying an NFS Server”

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## B.5. Log Collector

### B.5.1. Log Collector

A log collection tool is included in the Red Hat Enterprise Virtualization Manager. This allows you to easily collect relevant logs from across the Red Hat Enterprise Virtualization environment when requesting support.

The log collection command is **rhevm-log-collector**. You are required to log in as the **root** user and provide the administration credentials for the Red Hat Enterprise Virtualization environment. The **rhevm-log-collector *-h*** command displays usage information, including a list of all valid options for the **rhevm-log-collector** command.

**See Also:**

- Section B.5.2, “Syntax for rhevm-log-collector Command”
- Section B.5.3, “Basic Log Collector Usage”
- Section B.5.4, “Collecting Logs”
- Appendix A, *Log Files*

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## B.5.2. Syntax for rhevm-log-collector Command

The basic syntax for the log collector command is:

```
rhevm-log-collector [options] list [all, clusters, datacenters]
rhevm-log-collector [options] collect
```

The two supported modes of operation are ***list*** and ***collect***.

- The ***list*** parameter lists either the hosts, clusters, or data centers attached to the Red Hat Enterprise Virtualization Manager. You are able to filter the log collection based on the listed objects.
- The ***collect*** parameter performs log collection from the Red Hat Enterprise Virtualization Manager. The collected logs are placed in an archive file under the **/tmp/logcollector** directory. The **rhevm-log-collector** command assigns each log a specific file name.

Unless another parameter is specified, the default action is to list the available hosts together with the data center and cluster to which they belong. You will be prompted to enter user names and passwords to retrieve certain logs.

There are numerous parameters to further refine the **rhevm-log-collector** command.

**General options**

***--version***

Displays the version number of the command in use and returns to prompt.

***-h*, *--help***

Displays command usage information and returns to prompt.

***--conf-file=PATH***

Sets ***PATH*** as the configuration file the tool is to use.

***--local-tmp=PATH***

Sets ***PATH*** as the directory in which logs are saved. The default directory is **/tmp/logcollector**.

***--ticket-number=TICKET***

Sets ***TICKET*** as the ticket, or case number, to associate with the SOS report.

***--upload=FTP_SERVER***

Sets ***FTP_SERVER*** as the destination for retrieved logs to be sent using FTP. Do not use this option unless advised to by a Red Hat support representative.

***--log-file=PATH***

Sets ***PATH*** as the specific file name the command should use for the log output.

***--quiet***

Sets quiet mode, reducing console output to a minimum. Quiet mode is off by default.

***-v*, *--verbose***

Sets verbose mode, providing more console output. Verbose mode is off by default.

### Red Hat Enterprise Virtualization Manager Options

These options filter the log collection and specify authentication details for the Red Hat Enterprise Virtualization Manager.

These parameters can be combined for specific commands. For example, **`rhevm-log-collector --user=admin@internal --cluster ClusterA,ClusterB --hosts "SalesHost"*`** specifies the user as **`admin@internal`** and limits the log collection to only **`SalesHost`** hosts in clusters **`A`** and **`B`**.

***--no-hypervisors***

Omits virtualization hosts from the log collection.

***-u USER*, *--user=USER***

Sets the user name for login. The ***USER*** is specified in the format ***user*@*domain***, where ***user*** is the user name and ***domain*** is the directory services domain in use. The user must exist in directory services and be known to the Red Hat Enterprise Virtualization Manager.

***-r FQDN*, *--rhevm=FQDN***

Sets the fully qualified domain name of the Red Hat Enterprise Virtualization Manager server from which to collect logs, where ***FQDN*** is replaced by the fully qualified domain name of the Manager. It is assumed that the log collector is being run on the same local host as the Red Hat Enterprise Virtualization Manager; the default value is **`localhost`**.

***-c CLUSTER*, *--cluster=CLUSTER***

Collects logs from the virtualization hosts in the nominated ***CLUSTER*** in addition to logs from the Red Hat Enterprise Virtualization Manager. The cluster(s) for inclusion must be specified in a comma-separated list of cluster names or match patterns.

***-d DATACENTER*, *--data-center=DATACENTER***

Collects logs from the virtualization hosts in the nominated ***DATACENTER*** in addition to logs from the Red Hat Enterprise Virtualization Manager. The data center(s) for inclusion must be specified in a comma-separated list of data center names or match patterns.

***-H HOSTS_LIST*, *--hosts=HOSTS_LIST***

Collects logs from the virtualization hosts in the nominated ***HOSTS_LIST*** in addition to logs from the Red Hat Enterprise Virtualization Manager. The hosts for inclusion must be specified in a comma-separated list of host names, fully qualified domain names, or IP addresses. Match patterns are also valid.

### SOS Report Options

The log collector uses the JBoss SOS plugin. Use the following options to activate data collection from the JMX console.

***--jboss-home=JBOSS_HOME***

JBoss installation directory path. The default is **`/var/lib/jbossas`**.

***--java-home=JAVA_HOME***

Java installation directory path. The default is **`/usr/lib/jvm/java`**.

***--jboss-profile=JBOSS_PROFILE***

Displays a quoted and space-separated list of server profiles; limits log collection to specified profiles. The default is ***`'rhevm-slimmed'`***.

***--enable-jmx***

Enables the collection of run-time metrics from Red Hat Enterprise Virtualization's JBoss JMX interface.

***--jboss-user=JBOSS_USER***

User with permissions to invoke JBoss JMX. The default is ***`admin`***.

***--jboss-logsize=LOG_SIZE***

Maximum size in MB for the retrieved log files.

***--jboss-stdjar=STATE***

Sets collection of JAR statistics for JBoss standard JARs. Replace ***STATE*** with **`on`** or **`off`**. The default is **`on`**.

***--jboss-servjar=STATE***

Sets collection of JAR statistics from any server configuration directories. Replace ***STATE*** with **`on`** or **`off`**. The default is **`on`**.

***--jboss-twiddle=STATE***

Sets collection of twiddle data on or off. Twiddle is the JBoss tool used to collect data from the JMX invoker. Replace ***STATE*** with **on** or **off**. The default is **on**.

***--jboss-appxml=XML_LIST***

Displays a quoted and space-separated list of applications with XML descriptions to be retrieved. Default is **all**.

### SSH Configuration

***--ssh-port=PORT***

Sets ***PORT*** as the port to use for SSH connections with virtualization hosts.

***-k KEYFILE*, *--key-file=KEYFILE***

Sets ***KEYFILE*** as the public SSH key to be used for accessing the virtualization hosts.

***--max-connections=MAX_CONNECTIONS***

Sets ***MAX_CONNECTIONS*** as the maximum concurrent SSH connections for logs from virtualization hosts. The default is **10**.

### PostgreSQL Database Options

The ***pg-pass*** parameter includes the Red Hat Enterprise Virtualization Manager database in the log. The database user name and database name must be specified if they have been changed from the default values.

Use the ***pg-dbhost*** parameter if the database is not on the local host. Use the optional ***pg-host-key*** parameter to collect remote logs. The PostgreSQL SOS plugin must be installed on the database server for remote log collection to be successful.

***--no-postgresql***

Disables collection of database. Database collection is performed by default.

***--pg-user=USER***

Sets ***USER*** as the user name to use for connections with the database server. The default is **postgres**.

***--pg-dbname=DBNAME***

Sets ***DBNAME*** as the database name to use for connections with the database server. The default is **rhevm**.

***--pg-dbhost=DBHOST***

Sets ***DBHOST*** as the host name for the database server. The default is **localhost**.

***--pg-host-key=KEYFILE***

Sets ***KEYFILE*** as the public identity file (private key) for the database server. This value is not set by default; it is required only where the database does not exist on the local host.

**See Also:**

- Section B.5.1, “Log Collector”
- Section B.5.3, “Basic Log Collector Usage”
- Section B.5.4, “Collecting Logs”

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## B.5.3. Basic Log Collector Usage

In this example log collector is run to collect all logs from the Red Hat Enterprise Virtualization Manager and the three attached hosts. Additionally the database and JBoss logs are also collected.

**Example B.9. Log Collector Usage**

```
# rhevm-log-collector
Please provide the username for rhevm (CTRL+D to abort):
admin@directory.demo.redhat.com
Please provide the password for rhevm (CTRL+D to abort):
Host list (datacenter=None, cluster=None, host=None):
Data Center          | Cluster               | Hostname/IP Address
SalesDataCenter      | SalesCluster          | 192.168.122.250
EngineeringDataCenter | EngineeringCluster    | 192.168.122.251
FinanceDataCenter    | FinanceCluster        | 192.168.122.252
# rhevm-log-collector collect
Please provide the username for rhevm (CTRL+D to abort):
admin@directory.demo.redhat.com
Please provide the password for rhevm (CTRL+D to abort):
About to collect information from 3 hypervisors. Continue? (Y/n): Y
INFO: Gathering information from selected hypervisors...
INFO: collecting information from 192.168.122.250
INFO: collecting information from 192.168.122.251
INFO: collecting information from 192.168.122.252
INFO: finished collecting information from 192.168.122.250
INFO: finished collecting information from 192.168.122.251
INFO: finished collecting information from 192.168.122.252
Please provide the password to dump the PostgreSQL database (CTRL+D to abort):
INFO: Gathering PostgreSQL the RHEV-M database and log files from localhost...
INFO: Gathering RHEV-M information...
Please provide the password for jboss (CTRL+D to abort):
INFO: Log files have been collected and placed in /tmp/logcollector/sosreport-
rhn-account-20110804121320-ce2a.tar.xz.
      The MD5 for this file is 6d741b78925998caff29020df2b2ce2a and its size is
26.7M
```

**See Also:**

- Section B.5.1, “Log Collector”
- Section B.5.2, “Syntax for rhevm-log-collector Command”
- Section B.5.4, “Collecting Logs”

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### B.5.4. Collecting Logs

In this example Log Collector is run to collect all logs from the Red Hat Enterprise Virtualization Manager, and the three attached hosts. Additionally the database and JBoss logs are also collected.

**Example B.10. Log Collection**

```
# rhevm-log-collector
Please provide the username for rhevm (CTRL+D to abort):
admin@directory.demo.redhat.com
Please provide the password for rhevm (CTRL+D to abort):
Host list (datacenter=None, cluster=None, host=None):
Data Center          | Cluster               | Hostname/IP Address
SalesDataCenter      | SalesCluster          | 192.168.122.250
EngineeringDataCenter | EngineeringCluster    | 192.168.122.251
FinanceDataCenter    | FinanceCluster        | 192.168.122.252
# rhevm-log-collector collect
Please provide the username for rhevm (CTRL+D to abort):
admin@directory.demo.redhat.com
Please provide the password for rhevm (CTRL+D to abort):
About to collect information from 3 hypervisors. Continue? (Y/n): Y
INFO: Gathering information from selected hypervisors...
INFO: collecting information from 192.168.122.250
INFO: collecting information from 192.168.122.251
INFO: collecting information from 192.168.122.252
INFO: finished collecting information from 192.168.122.250
INFO: finished collecting information from 192.168.122.251
INFO: finished collecting information from 192.168.122.252
Please provide the password to dump the PostgreSQL database (CTRL+D to abort):
INFO: Gathering PostgreSQL the RHEV-M database and log files from localhost...
INFO: Gathering RHEV-M information...
Please provide the password for jboss (CTRL+D to abort):
INFO: Log files have been collected and placed in /tmp/logcollector/sosreport-
rhn-account-20110804121320-ce2a.tar.xz.
      The MD5 for this file is 6d741b78925998caff29020df2b2ce2a and its size is
26.7M
```

**See Also:**

- Section B.5.1, “Log Collector”
- Section B.5.2, “Syntax for rhevm-log-collector Command”
- Section B.5.3, “Basic Log Collector Usage”

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## B.6. SPICE Proxy

### B.6.1. SPICE Proxy Overview

The SPICE Proxy is a tool used to connect SPICE Clients to guests when the SPICE Clients are outside the network that connects the hypervisors.

Setting up a SPICE Proxy consists of installing **Squid** on a machine and configuring **iptables** to allow

proxy traffic through the firewall.

Turning a SPICE Proxy on consists of using **rhevm-config** on the Manager to set the key **SpiceProxyDefault** to a value consisting of the name and port of the proxy.

Turning a SPICE Proxy off consists of using **rhevm-config** on the Manager to remove the value that the key **SpiceProxyDefault** has been set to.

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## B.6.2. SPICE Proxy Machine Setup

### Summary

This procedure explains how to set up a machine as a SPICE Proxy. A SPICE Proxy makes it possible to connect to the Red Hat Enterprise Virtualization network from outside the network. We use **Squid** in this procedure to provide proxy services.

**Procedure B.2. Installing Squid on a RHEL Machine**

1. Install **Squid** on the Proxy machine:

```
# yum install squid
```

2. Open **/etc/squid/squid.conf**. Change

```
http_access deny CONNECT !SSL_ports
```

To

```
http_access deny CONNECT !Safe_ports
```

3. Restart the proxy:

```
# service squid restart
```

4. Open the default squid port:

```
# iptables -A INPUT -p tcp --dport 3128 -j ACCEPT
```

5. Make this iptables rule persistent:

```
# iptables-save
```

### Result

You have now set up a machine as a SPICE proxy. Before connecting to the Red Hat Enterprise Virtualization network from outside the network, activate the SPICE proxy.

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## B.6.3. Turning on SPICE Proxy

### Summary

This procedure explains how to activate (or turn on) the SPICE proxy.

**Procedure B.3. Activating SPICE Proxy**

1. On the Manager, use the rhevm-config tool to set a proxy:

```
# rhevm-config -s SpiceProxyDefault=someProxy
```

2. Restart the **ovirt-engine** service:

```
# service ovirt-engine restart
```

The proxy must have this form:

```
protocol://[host]:[port]
```

For example:

```
https://proxyname.example.com:8080
```

**Note**

Different protocols can be specified with the **protocol://** prefix. If no protocol is specified in the proxy string (or if the proxy string doesn't match a supported proxy), the proxy is treated as an HTTP proxy.

**Result**

SPICE Proxy is now activated (turned on). It is now possible to connect to the Red Hat Enterprise Virtualization network through the SPICE proxy.

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## B.6.4. Turning off SPICE Proxy

**Summary**

This procedure explains how to deactivate (or turn off) the SPICE proxy.

**Procedure B.4. Clearing a SPICE Proxy (Turning off a SPICE Proxy)**

1. Log in to the Manager:

```
$ ssh root@[ip of Manager]
```

2. To clear a SPICE Proxy, log in to the Manager and run:

```
# rhevm-config -s SpiceProxyDefault=""
```

**Result**

SPICE proxy is now deactivated (turned off). It is no longer possible to connect to the Red Hat Enterprise Virtualization network through the SPICE proxy.

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# Revision History

**Revision 3.2-32.402** **Tue Nov 12 2013** **Rüdiger Landmann**

Rebuild with Publican 4.0.0

**Revision 3.2-32** **Wed Nov 06 2013** **Zac Dover**

BZ#1007786 - Corrected the Cluster compatibility and data center sections

**Revision 3.2-31** **Wed Nov 06 2013** **Zac Dover**

BZ#1007786 - Corrected the Cluster compatibility and data center sections

**Revision 3.2-30** **Thursday 22 Aug 2013** **Tim Hildred**

Changed "engine-config" to "rhevm-config" in SPICE Proxy documentation.

**Revision 3.2-29** **Mon 19 Aug 2013** **Tim Hildred**

BZ#612810 - Resolved a confusing typo in "Preparing iSCSI Storage".

**Revision 3.2-28** **Fri 16 Aug 2013** **Tim Hildred**

BZ#981764 - Internet Explorer 10 touch-screen version not supported.
BZ#988172 - Made it clear which SPICE features are supported by which clients.
BZ#988172 - Updated supported SPICE features in Red Hat Enterprise Linux 6 clients.
BZ#965332 - Changed suggested server type to install on Linux host from 6.3 to 6.
BZ#719765 - Updated selector to send specific messages to server.
BZ#719765 - Updated semanage command.
BZ#987207 - rhev-hypervisor corrected to rhev-hypervisor6
BZ#986735 - Updated host firewall ports to reflect change SPICE range.

**Revision 3.2-27** **Fri 16 Aug 2013** **Zac Dover**

BZ#995905 - Improved SPICE Proxy Installation and Configuration section yet again

**Revision 3.2-26** **Fri 16 Aug 2013** **Zac Dover**

BZ#995905 - Improved SPICE Proxy Installation and Configuration section yet again

**Revision 3.2-25** **Fri 16 Aug 2013** **Zac Dover**

BZ#995905 - Improved SPICE Proxy Installation and Configuration section again

**Revision 3.2-24** **Thu 15 Aug 2013** **Zac Dover**

BZ#995905 - Improved SPICE Proxy Installation and Configuration section (fixed # service squid restart)

**Revision 3.2-23** **Tue 13 Aug 2013** **Zac Dover**

BZ#995905 - Improved SPICE Proxy Installation and Configuration section

**Revision 3.2-22** **Mon 12 Aug 2013** **Zac Dover**

BZ#995905 - Added SPICE Proxy Installation and Configuration section

**Revision 3.2-21** **Tue Aug 06 2013** **Zac Dover**

BZ#963014 - expanding on network configuration and troubleshooting

**Revision 3.2-20** **Tue Aug 06 2013** **Zac Dover**

BZ#963014 - network configuration and troubleshooting

**Revision 3.2-19** **Fri Aug 2 2013** **Cheryn Tan**

Added SPICE support information to list of supported guest operating systems.

**Revision 3.2-18** **Mon Jun 24 2013** **Tim Hildred**

Resolves BZ#974366, added cli example of rhn-channel to step 1
Resolves BZ#974365
Resolves BZ#974365, corrected name of JBoss channel as it appears in WebUI.
Resolves BZ#958909, added step requiring user to remove Red Hat Enterprise Virtualization 3.0 channels before upgrading to 3.1
resolves BZ#975616, incorrect yum-config-manager command
resolved BZ#975616

**Revision 3.2-17** **Thu Jun 20 2013** **Tim Hildred**

BZ#975616 - Fixed yum-config-manager command in *Upgrading to Red hat Enterprise Virtualization 3.2*.

**Revision 3.2-16** **Wed Jun 19 2013** **Zac Dover**

BZ#956393 - adding instructions for the installation of livecd-tools

**Revision 3.2-15** **Wed Jun 19 2013** **Zac Dover**

BZ#956393 - undoing the changes made in 3.2-14.

**Revision 3.2-14** **Wed Jun 19 2013** **Zac Dover**

BZ#956393 - Changing all instances of package name "rhev-hypervisor" to "rhev-hypervisor-advanced"

**Revision 3.2-13** **Tue 11 Jun 2013** **Zac Dover**

BZ#973010 - the hazards of running services on RHEV

**Revision 3.2-12** **Wed 29 May 2013** **Andrew Burden**

BZ#876827 - Corrected log filepaths.

**Revision 3.2-11** **Fri 24 May 2013** **Cheryn Tan**

BZ#920671 - Documented workaround for hypervisor upgrade error.

**Revision 3.2-10** **Mon 20 May 2013** **Cheryn Tan**

Reverted to original rhev-hypervisor package and filenames.

**Revision 3.2-09** **Thu 18 April 2013** **Tim Hildred**

BZ#863475 - fixed yum search command

**Revision 3.2-08** **Mon 15 April 2013** **Tim Hildred**

BZ#863475 - added step about enabling JBoss repo to the RHSM instructions.

**Revision 3.2-07** **Fri 12 April 2013** **Tim Hildred**

BZ#950850 - the Hypervisor is now available in the Manager's channel, removed references to Hypervisor channel.

**Revision 3.2-06** **Tue 02 April 2013** **Tim Hildred**

Added upgrading Guest Tools content.

| | | |
|---|---|---|
| **Revision 3.2-05** | **Wed 27 March 2013** | **Zac Dover** |

BZ#884616 - removing references to JBoss and replacing them with references to ovirt-engine in the configuration procedures
BZ#888481 - Added the 'Upgrading to 3.2' topic

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| **Revision 3.2-04** | **Tue 26 March 2013** | **Tim Hildred** |

Staging for inclusion in rhevm-doc package for 3.2 beta1.
Updated installation dialog.

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| **Revision 3.2-03** | **Tue 12 March 2013** | **Tim Hildred** |

Added step to the compatibility version procedures (DC,Cluster), requiring that hosts be in maintenance mode.
Updated installation dialog.

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| **Revision 3.2-02** | **Tue 05 March 2013** | **Andrew Burden** |

BZ#876827 - Fixed log filepaths

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| **Revision 3.2-01** | **Fri 01 March 2013** | **Tim Hildred** |

Staging for Beta1

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| **Revision 3.2-00** | **Wed Feb 27 2013** | **Tim Hildred** |

Updated revision numbering to track product version, initial staging in the lead up to 3.2Beta1